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ABSTRACT

This review of higher education research conducted in Australia and New Zealand is divided in two parts. Part I deals generally with research into academic success and failure and includes: (1) selection and wastage; (2) selection, years spent in sixth form, and a Formula; (3) age and maturity; (4) other student variables, such as reasons students gave for failure; (5) factorial studies and motivation; (6) problems of Asian and other students; (7) resident and non-resident students; and (8) types of schools students attended before coming to a university. Part II is concerned with developing patterns of research and examines studies on: (1) teaching, staff-student relations, and values; (2) the criteria for examinations and pass rates; (3) professionalization; and (4) miscellaneous historical, sociological, economic, administrative, descriptive, and comparative studies. A lengthy bibliography is included, as well as a summary of a speech by C. Sanders outlining the problems of first-year failure in Australian universities and making proposals for further research. (AF)

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HIGHER EDUCATION RESEARCH IN AUSTRALIA AND NEW ZEALAND

A discussion of the research literature and other studies

By

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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He has written various articles on higher education, and his book *Success, Failure and Wastage in Higher Education* was published by Harrap in January 1970.

PREFACE

Research into higher education has been carried out in Australia and New Zealand by a relatively small number of people whose names will therefore be noted in the text to what may seem a disproportionate extent. Their contribution to the literature has indeed been disproportionate because of the length of time they have been engaged in it, the small number of research units which until recently have been in existence, and the long period in which few researchers were being trained. There has been an upsurge of interest in research into higher education in recent years; the literature can be expected to widen in the topics studied, and the list of contributors will become more numerous.

The bibliography at the end of this monograph is fairly exhaustive and includes many items not referred to in the text. Most of those omitted from the text are not research reports in that they have not depended upon the collection of data. They have been included to give readers some introduction to the general literature on Australian and New Zealand higher education.

ACKNOWLEDGEMENTS

I would like to thank Professor C. Sanders, formerly Professor of Education and Dean of the Faculty of Education in the University of Western Australia, one of the major forces in educational research in Australia for many years, and now Chairman of the Tertiary Education Commission, for help in providing material, for introducing me to important sources which otherwise would have been missed, and for reading the manuscript and making helpful comments.

Thanks are due also to D. S. Anderson, formerly Head of the Educational Research Unit at the University of Melbourne, and now Head of a similar unit in the Research School of Social Sciences, Australian National University, Canberra, who also corresponded and read the manuscript. Professor P. H. Partridge, Director of the Research School of Social Sciences, Australian National University, while in London gave me the benefit of several personal discussions and the late Sir Fred Schonell, former Vice-Chancellor, University of Queensland gave considerable help by correspondence.

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G. W. M.
August 1969.

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PART I. RESEARCH INTO ACADEMIC SUCCESS AND FAILURE

General Background of Higher Education in Australia and New Zealand

Australian and New Zealand higher education has been almost confined to the universities, unlike Britain and the United States where a large sector of higher education is outside the universities. Although teachers' colleges, technical colleges and agricultural colleges have made a significant contribution to higher education, they have not in the past constituted a large sector. Now however some rapid development is taking place outside universities.

Australia has fourteen universities, the oldest ones, Sydney and Melbourne, were established in 1850 and 1853. At the end of the last war there were still only six. Of the fourteen now in existence, five have been created in the last decade. In the same time the student population has grown from 36,568 in 1957 to about 100,000 in 1969; forty per cent of these are part-time or external enrolments. Twelve per cent of the 18–24 year old population are students.

New Zealand has seven universities, of which four have been created since the last war. The University of New Zealand's four constituent colleges became separate independent universities in 1961.

Entry to Australian and New Zealand universities is different from that in Britain. Matriculation examinations are generally taken in four or five subjects, and admission depends on success in these. Whereas in Britain, two or three specialised 'A' levels are required, in Australia and New Zealand one year of sixth form is more the custom and the third year sixth is extremely rare.

Although a greater number of subjects is taken in Australia and New Zealand, they tend to cluster into cognate groups of science or arts subjects. Even so there is greater flexibility than in Britain. Some universities have a 'common' matriculation requirement, faculty requirements are less specific than in most British universities and allow a wider choice of university studies for the sixth former.

Another difference is that most university courses are structured in a way that allows flexibility in the choice of subjects within a degree. Faculties regulate how subjects must be chosen to form 'majors'. Majors consist of three subjects or fields within a discipline. An arts course may be comprised of nine subjects. These will probably be made up of two majors, a sub-major and a foreign language. The two majors may be in two separate disciplines or, if the student wishes, they may be in a single discipline. A science subject may be compulsory in an arts course, and a philosophy sub-major (two subjects in philosophy) would probably be mandatory.

There is no need for an undergraduate to take a mixed course if he does not wish to. Instead he may decide on a highly specialised course by electing to take six subjects in one discipline – a double major. But the philosophy sub-major and the foreign language would still be mandatory.

Most students take pass degrees. This is not because they are inferior students. Pass

degrees have to be worked for, the student being required to satisfy separate examiners in each subject, so that each is a separate hurdle to be surmounted in the pursuit of a degree. To be selected for an honours degree usually requires of the student that, in his first year at the university, he should be in the top level of accomplishment. Only about ten per cent of the student body choose or are selected for honours courses. About three per cent may be awarded first class honours, about seven per cent second class, and the remainder will be given pass degrees. Most Arts and Science Honours courses take four or five years and this is another reason for the small proportion of students opting for them. Only about one third of any year's intake will gain even their pass degrees in minimum time, and only two thirds will gain them eventually. The overall wastage rate in Australian and New Zealand universities has stood at around 33 per cent for decades, but this has been reduced a little in recent years.

The Main Centres of Higher Education Research, in Australia and New Zealand.

These are modest in number. The population of Australia is only 12 million and that of New Zealand is very much smaller at about 2¾ million. The demand for research and the resources to finance it are therefore limited. Also, the percentage of gross national product that Australia spends on education is small compared with the proportion spent by most other developed countries. Nevertheless, there has been some significant research accomplished in both countries.

The expansion of post-graduate study in Australian universities has been rapid in the last 15 to 18 years. Sydney for example had only 27 Ph. D students in 1952 and this number had grown to 363 in 1966. The number of candidates for the Ph.D. and other higher degrees has increased at a comparable rate in all of the older universities. However the proportion of this research effort which has been devoted to education, and higher education in particular, is quite small. Most of the studies in higher education have been done by a relatively small number of people in the Universities of Melbourne, Western Australia, New South Wales, Tasmania, Queensland and New England. An additional Educational Research Unit has been established at the Australian National University. Considering the difficulties under which research in the social sciences, and education in particular has been done, it is a credit to those who have chosen to tackle important problems in these fields, that they have accomplished what they have. Caiden [45] has shown how limited the resources have been in Australia. The lack of facilities has probably been most marked in higher education.

In addition to the work in universities, other educational research has been undertaken by the Australian Council for Educational Research but most of their work has been in the field of primary and secondary education. The New Zealand Council for Educational Research has extended its work more into the field of higher education. Its former Director, G. W. Parkyn has produced two notable volumes [130, 131] on success and failure at the university, and Small has published his report of an intensive study of first year students' adjustment to the university, which complements the work of Parkyn. [183]

In this monograph, every effort will be made to cover all the main research fields in higher education, most of which are of a practical orientation, related to problems of selection, wastage, performance, student progress generally and the professionalisation of certain groups during their academic studies, particularly law, medicine, dentistry and engineering. Some historical and sociological studies, reports of conferences of Vice-Chancellors and teachers in which papers were given by research workers and others will also

be discussed more briefly. Topics discussed at these conferences and reports of further studies have included student residence, teaching, school antecedents of performance in higher education, student guidance and examinations.

Selection and Wastage

The greatest amount of research has been done into student selection and wastage and related topics. A study of the research in these fields in Australia and New Zealand yields a composite and coherent picture. The body of findings by several different researchers is remarkably consistent, whether the study samples involved are arts, humanities, science, applied science, engineering, medicine or education students.

Compared with Britain, Australia and New Zealand have a much higher failure rate, especially in the first year, after which it falls away considerably. Whereas Britain's overall wastage rate is about 13 per cent, the Australian and New Zealand rates are 30–40 per cent. As in Britain the greater wastage is in science and technology. The percentage of students who graduate in minimum time is also about 35–40 per cent – up to 60 per cent in arts. The percentage gaining degrees regardless of the time taken is of the order of 60–70 per cent. The overall wastage rate, approximating 33 per cent, has caused great concern over the years. It is therefore not surprising that most research has been done in this field.

There have usually been considerable differences in the proportions of Australian students passed and failed by different faculties – a fact also noted by the Robbins Committee in Britain. Olsen[126] found this in Queensland and the same is true in other places. According to Olsen, while examiners in medicine, dentistry and engineering were passing 70 to 80 per cent of their first year candidates, examiners in physics, chemistry, mathematics and zoology were very much less generous. In the technical faculties sometimes only about half the candidates were being passed. This could conceivably be reflecting the quality of the students entering the different faculties, but it may also depend upon the varying quality of teaching and the criteria used in examining. It would be extremely difficult to establish an equivalence between degrees in the various fields. So far no valid method has been evolved of bringing about any comparison that would satisfy all faculties.

The high failure rate of students in Australian and New Zealand universities led in the past to a search for better ways of selecting students. The assumption has been as in many other countries, that if 'better students' could be found, the failure rate would be much reduced. Presumably if selection could be perfected there would be no wastage. The Australian and New Zealand experience is that there is little hope of finding improved selection methods which will reduce wastage to any appreciable extent. This may be just as true for Britain. The loss of a sizeable proportion of highly selected students each year will, no doubt, continue to attract researchers to this problem.

Hohne's war-time and immediate post-war studies of student progress in arts and science faculties at the University of Melbourne set the stage for later similar studies of wastage.[87,88,89,90,91] Although his criticisms were largely of certain aspects of universities, e.g. examination reliability and fixed pass rates, these aspects have not until recently been studied much by other researchers, but have been ignored in the search for 'better students' and 'reasons' for students' failure.

It is true that there is a substantial overall correlation between entrance examination results and success in higher education. In Gray and Short's study,[77] one sub-sample having

minimal entrance qualifications had a pass rate of only 30 per cent, while others with the highest entrance qualifications had a pass rate of 93 per cent. It would seem from their study that a considerable improvement could be gained by better selection on the criteria of school examination results. However, the same authors conceded that when higher school results are demanded for entry, the higher overall pass rate is gained at the expense of many students being excluded, who might have done very well if allowed to enter university. Gray and Short gave an instance of how diminishing returns occur in this way. They calculated that a first year pass rate of 80 per cent in science based courses could result from imposing a high standard of entrance, but this would require exclusion of about 40 per cent of the customary intake, and a loss of about 25 per cent of those who would have passed, had they been allowed entry.

Parkyn [130] found a correlation of 0·36 between school results and university performance in first year, and only 0·15 between school results and later university performance in second and third years. This order of correlation, while statistically significant in the case of first year results, accounts for only 13 per cent of the variance in achievement. Since Kendall's *tau* was used, this estimate may be conservative. However, it seems certain that at least 80 per cent of variance still remains to be accounted for by other factors. Additional predictors used in combination contributed little in the way of accuracy. Success and failure, according to Parkyn is not proportionately distributed over the whole range of academic ability. Success is possible at quite a low level of ability, as Schonell et al also found. [178] There are some very selective institutions such as Yale, Harvard, Stanford and Oxford where pass rates are as high as 90 per cent and higher. In these instances it can be claimed that other factors, in addition to selection, account for this. Some of these will be discussed later under appropriate headings.

Parkyn's research in New Zealand is particularly interesting and extremely thorough. The table shows that of students, even at the lowest range of ability as assessed by matriculation results, 41 per cent passed in first year subjects. It was not possible to tell *which individual students* in the highest ability or the lowest ability groups would be capable of passing in their university studies even though Parkyn's multiple correlation was 0·54.

Pass Percentage According to Sixth Form Average Rank (First Year Full Time Students)

Sixth Form Rank	Per cent of Students in Group	Pass Per-centage
1	7	90
2	24	86
3	38	62
4	24	50
5	7	41
All Students	100	65

Source: Parkyn (1967), p. 17.

A study by A. W. Anderson [7, 10] showed that when selection, on the basis of IQ was made more rigorous, and the student intake was limited to students having IQs above 125, then 24 per cent of the passing group would have been excluded. If IQs of 130 were required of candidates, then 52 per cent of the passing group would have been denied places. Thus selection on the basis of intelligence would have been of limited value. Again, taking a different criterion of selection, that of school examination results, Anderson's research demonstrated that if selection of students had been confined to those with average marks of 65 per cent in five subjects, 14 per cent of the passing group would have been kept out of higher education. If the average required had been raised to 70 per cent, 31 per cent of these students who actually passed would have been excluded. Selection on the criterion of matriculation examination performance is more accurate than intelligence, as might have been expected since it is academic ability which is needed for success at the university, rather than the more general intellectual ability which is sampled by intelligence tests. The diminishing returns are again seen to become very acute above a certain level. The optimum level, taking measured intelligence as the criterion, appeared in Anderson's study to be in the region below IQ 125, and the optimum for matriculation marks appeared to be between 60 and 65 per cent.

Anderson also concluded that students with high measured intelligence and low matriculation marks are poor risks in science studies. In contrast those with lesser general ability as measured by IQ tests, but with good matriculation results are good risks. Students with low IQ scores and low matriculation marks were no worse than those of high IQ and low matriculation. Two alternative inferences may be drawn; one, that students of high IQ and low marks need to be taught better study methods or, two, their personality or motivation may fall short in a way which militates against academic attainment.

Anderson's study bore out Sanders findings in 1948, [151] that by taking into account IQ level in addition to school results there could be no gain in selection. At that time, entering students had IQs of about 120 and third year students stood at 126, and one would thus expect IQ to be a reasonable predictor of academic attainment in the university. Sanders claimed that little, if any, advantage could be derived in this way beyond the amount of prediction available from school results, and that other personal characteristics enter into the problem. In fact, Sanders pointed out in 1951 that science students having IQs of 115 and lower were not by any means the worst failures. [152] Over one four year period, almost as high a percentage of science and engineering students with IQs below 115 had graduated, or were continuing their courses, as students with IQs of 125 plus – 70 per cent as against 76 per cent.

It is more common now to regard IQ as a limited concept, and it has been under heavy fire in recent years. Even so Sanders mentioned correlations as high as 0·49 between verbal type IQ tests and university attainment in Arts courses. If any other variable could now be found having similar high relationships to other university results, it would be hailed as a breakthrough. Yet social class, which still attracts serious respect as a variable to be considered, rarely has a higher correlation than 0·30 to 0·35, its predictive validity being only about half that of IQ.

In 1964, D. S. Anderson, commenting on research in Australia and other countries, concluded that of the many possible predictors of success in higher academic studies, school results were the best single one. However, the relation between them was not sufficiently strong for more stringent selection on this criterion alone to lead to substantial increases in pass rates. [23, 24] He cited a Melbourne study which showed that to effect an improvement in the pass rate from 64 per cent to 74 per cent would have required the exclusion from the

university of 30 per cent of the applicants. Yet 43 per cent of those who would have been rejected passed in the critical first year. The prognosis from first year results to succeeding years is better. It would have made little sense indeed to select so rigorously, even when using the most accurate predicto . Schonell et al in Queensland reported a similar pattern.[178] *The price of excluding from the university about 30 students who would have failed to graduate would have been the loss of 44 students who would have been successful in attaining their degrees. The proportion of students graduating would have been 71·8 per cent compared with 68·5 per cent.*

These studies have been cited in some detail to emphasise the point that raising entrance standards alone will not make a significant contribution towards reducing the failure rate. Whatever attempt is made to improve selection on the criterion of IQ tests or school results, it means that together with the potential failures who might be excluded will be many highly satisfactory students also denied places. A number of separate studies have confirmed this, and now add up to a convincing body of evidence.

When we compare school results and university results in specific subjects, according to Schonell et al, matriculation and first year university results have a higher correlation for chemistry, physics and mathematics, while in subjects like history, French, Latin or English there is less relationship. This suggests that prediction from one level to another is more likely to be achieved in subjects which can be objectively assessed.

The fallacy of relying too heavily upon school results, even in those subjects related to university study, is further made clear by Parkyn,[131] who found that composite marks derived from several school subjects often correlate more highly with first year university results than school marks in the subject itself. The median correlation between sixth form chemistry and first year results was 0·28, but between the composite sixth form results and first year chemistry was 0·36. For mathematics the same was true. Parkyn concluded that most of the first year failure was for reasons other than lack of ability or low prior attainments. He added that it is clear that the student group is potentially flexible and adaptable, and the abilities required for success in various scholastic subjects are themselves correlated to a considerable degree.

The idea of using an equivalent of the American Scholastic Aptitude Tests in selection has been discussed by Anderson,[24, 25] but he considers all selection as inefficient and not a real answer to the increasing demand for higher education. It is a view which warrants a great deal of attention. S.A.T. type tests may lessen cramming in the schools, but it is doubtful if any reasoning can justify closing the doors of higher education to increasing numbers of qualified school leavers who in the past would certainly have gained entry. This does not seem fair reward for greater educational aspiration and it appears that other solutions need to be found. The validity of University Entrance Examinations as a predictor of success in higher education was being called into question by Thomas, Beeby and Oram[190] in the 1930's in favour of accrediting by heads of carefully selected schools. The authors reported that students who, after passing Matriculation examinations, allowed one or two years to elapse before entering university, were more likely to end up with degrees than those who entered straight from school. Further Australian evidence on the fallacy of depending too heavily on academic results as predictors of future academic performance whether at transition from school to university, or from degree class to post-graduate performance is similar to that found in England by Gibson,[74] and Hudson.[92] Gibson discovered that many top flight Cambridge scientists had IQs about 120 and lower, and Hudson,[92] found that not all Fellows of the Royal Society had been particularly outstanding undergraduates. Anderson,[26] at the University of Melbourne, studied the subsequent careers of students who began undergraduate

work in 1956. Ten years later, the matriculation results of those who had completed Master's or Ph. D. degrees were examined. It was discovered that 9 per cent of the top third in matriculation results, 6 per cent of the middle third and 5 per cent of the lower third had completed higher degrees. It is of even greater interest that many of the recipients of higher degrees were originally admitted to the university under special regulations for persons in employment or older applicants, not obviously comparable to the top class of matriculant. Many would not have been able to gain places under the quotas now being applied in Australian universities as the number of candidates increases. Yet 17 per cent of this apparently less promising group have now completed higher degrees – more than double the proportion of ordinary matriculants.

In 1968, an objective type examination was set to secondary school students in their final year in the Australian Capital Territory, Tasmania, and Western Australia. The examination covered objective tests in mathematics, sciences, humanities, social sciences, and English expression. The project is known as the Tertiary Education Entrance Project. Data from the project are now being processed. Special procedures have been developed for the essay marking. The co-operating parties include the Commonwealth Department of Education and Science which financed it, the Australian Council for Educational Research which produced the tests, and the universities and schools of the Australian Capital Territory, Tasmania and Western Australia. It is probable that if the results of these tests show that they may be used as academic predictors, then at some time in the future, some combination of standard matriculation methods and American-type methods may be used in university entrance examinations in Australia.

Australian and New Zealand research over a long period shows that the use of school results, although the best single predictor, can if applied too rigorously, lead to serious wastage of academic talent by exclusion. The clearly demonstrated deficiencies of the use of school examination results has led to an interest in scholastic aptitude tests as a means of improving selection. Although they have the possible advantage of reducing cramming in schools, and are more objective and reliable than school examinations, they are not the complete answer to the problem of selection. Certainly selection criteria must be broadened to include more than school results. More interest is needed in helping and motivating students once they are admitted, by improving teaching and examining and by providing facilites such as counselling.

Selection, Years Spent in Sixth Form, and a Formula

The length of time the student has needed to satisfy matriculation requirements is a most important factor in selection. Hogben found that the two lowest performing groups of medical students contained substantial numbers who had taken longer than usual to achieve matriculation.[83] The time taken was also found to be important by Theobald, [187] in the study of first year students. Students who took two years, *having failed in the first attempt,* had a failure rate of 62 per cent, compared with 22 per cent for those who had taken only one year. The trend was still apparent when the level of matriculation marks was held constant. Again this finding was supported by Schonell's study [178] and by Gray and Short. [77] This is not to say that repeated years in the sixth are not advantageous in some way. They may well be, but it probably means that those who can satisfy entrance requirements in one try make more efficient university students, and it may be a waste of resources to keep them in the sixth form if they are merely repeating the same work and not seeking general education. In selecting students by standard of matriculation marks, the number of years required to obtain these marks should be taken into account. Alternatively where any work has been repeated selection could be made on the criterion of the first year mark.

The implications of these findings go even further. Since the better students appear to be those who have passed entrance requirements in one year, it may well be foolish to give places to candidates who have the best marks regardless of the time taken, for many of the better students who have not attempted the examinations twice may be excluded. More important, the places they should have been awarded will go to inferior students who may be less successful in their university work and place additional weight upon university resources.

In Australia it has been recognised in recent years that an adjustment needs to be made to compensate for the amount of time students take to pass entrance requirements. Injustice is incurred against rejected candidates whose parents either cannot afford or are not interested to keep them at school for an extra year or more in order to boost their results. And if grants are awarded simply to those with highest marks in matriculation examinations without regard to time taken, a great number of them will be given to students from richer families simply because their parents have been able to keep them there for a prolonged period. The imposition of quotas in recent years and the reluctance of the government to increase the number of grants available has made this injustice more acute.

There are advantages in students spending more than one year in the sixth form, but all too frequently the same ground has been covered twice for the express purpose of getting higher marks in the same subject repeated. This complaint has been registered by Lauwerys** with respect to British universities too – it is not only an Australian problem. If on the other hand new ground is covered in the extra years spent in the sixth the outcome may well be desirable, both as general education and as preparation for university, though the gains in the latter sense may not be great.

The poor prediction from school results to first year results at the university suggests that extra years in the sixth repeating subjects are, as far as selection is concerned, a waste of teachers and resources. A formula developed by Anderson at the Education Research Office in the University of Melbourne, is used in some Australian universities to reduce the injustice to students who have had only one year in the sixth form, and at the same time refines matriculation results as a predictive device or criterion for selection of students. [24]

Essentially, the formula gives extra marks for subjects taken in addition to the barest requirements for university entry, thus encouraging breadth of study in the sixth form. Where any repeated attempts have been made in the same subjects, the total marks are reduced. The justice of such a measure seems self-evident, though no research appears yet to have been done to demonstrate its efficiency.

The introduction of such a formula should improve prediction and it is to be hoped that studies will be conducted in each university or college where it is tried.

Age and Maturity

Age of the student at entry seems to have some association with university achievement, but the nature of the association requires careful interpretation. In Hughes' study [97] it appeared that young students attained better results than more mature students. Of those entering university at 16+, 60 per cent graduated in minimum time compared with the 22 per cent of those entering at 19+. Of those entering at 16+, 75 per cent graduated eventually compared with only 49 per cent of those entering at 19+. However, an important

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** See *Access to Higher Education: The International Study of University Admissions, Vol. II,* Section 11, U.N.E.S.C.O. and International Association of Universities. 1965.

qualification has to be made, namely that the most able students generally tend to fall into the younger age groupings, the most probable explanation being that the younger age groups include the brightest who have had fewer delays at school or have been promoted before their normal time and then find their way into university at a younger age than the general student population. If this is so, as Sanders suggests, [151] it would be wrong to attribute higher academic ability to youth as a matter of course, since it is not age that is the operative factor so much as the ability of particular candidates. Age then far from being a useful indicator for success in higher education is incidental, and mature students or the very young ones should not be excluded on the grounds of age alone. This was confirmed by Hughes.[95, 96, 97]

Mathematics, science and languages are thought by several researchers [137, 151, 163, 178] to be subjects in which younger candidates may achieve better results. The evidence from Sanders [163] indicates that for subjects in the humanities and social science especially English, philosophy, psychology, economics and law, mature age and experience are a considerable advantage. An early study [150] of ex-servicemen from the last war using young civilian entrants as a comparison group showed some clear differences in favour of the mature students. Ex-servicemen aged 22+ performed better in first year examinations, over all faculties as a whole, than young students straight from school. In science, engineering and medicine the young students were marginally superior, while the mature ex-servicemen performed much better than the young civilians in arts, law, dentistry and agriculture. Motivation may be the operative factor rather than age. After several years in the services, isolated from opportunities for progress in civilian life, it may have been that the ex-servicemen, in order to make up for lost time, were keen to take degrees in as short a time as possible, while the younger students, entering direct from civilian life, may have felt none of that pressure, and have been tired of study and unsure of the suitability of the field they had chosen – using the years in higher education as a moratorium as found by L. Douglas** in an English study. These arguments may sound a little obvious in retrospect, yet at the time it seems there was serious doubt in university and government circles whether ex-soldiers would be capable of settling into the discipline of higher study. In the event they acquitted themselves extremely well.

The early observations of Thomas, Beeby and Oram [190] in New Zealand, that university entrants do better academically if they have an interval away from study after leaving school appears well supported by the later research. Evidence favouring admission of mature students as opposed to restricting places largely to school leavers, is contained in a study conducted in two universities by the Department of Education and Science, Canberra.[50] A consistent trend was found showing that students who delayed their entrance to university a year or more after being awarded a place achieved better than matched groups who entered directly from school, and there were fewer drop-outs among them. Results were statistically significant, and it seems reasonable to conclude that a period away from studies is helpful in promoting entrants' future success. There certainly is no support for any *a priori* armchair theory that school leavers will become 'rusty'. Whether the trend is related to greater maturity itself or the rest away from studies, or whether the interim period gave the school leavers a chance to test their motivations for university, or whether they were able to choose courses better, is not clear. This would require more detailed longitudinal research. But it is clear that no harm can come from allocating a fair proportion of university places to students who have undergone such a testing, resting or maturing period after their school days, especially in the social sciences and humanities. Replication of controlled studies in Britain could have profound implications for our policies of selection and grant giving, and might well be given priority over much other research.

** L. Douglas (1964) – *Types of Students and Their Outlook on University Education: A Comparative Study of Students in Physical and Social Sciences. Ph. D. thesis. University of London.*

Other Student Variables

Both Australian and New Zealand researchers have studied the reasons students give for failure in higher education.[69,77,130,131,141,160,178,183] Flecker found that a large proportion of students claimed that they had experienced worries and anxiety which interfered with their studies. The main anxieties were: difficulties at home, ill-health, strained relations with parents, poor study facilities, worries about girl/boy friends, finances, and difficulty in settling to life at the university, whether living at home or in residence or hostel. He also found that successful students more often revised examination questions from other years, allotted their time between study and extra-curricular affairs more carefully, distributing their effort more evenly. Of the failing students, over 50 per cent said they worked hardest in the final term. This could mean that they neglected their work in the first two terms or that the students who passed worked more consistently over the whole year. Indeed, Pond[141] found that high achievers did more preliminary reading and read more of the specified references, especially in preparation for tutorials and seminars throughout the year.

High achievers made less complaints about the large size of lectures or difficulties about getting help with their academic problems from staff members. More often than the failing students they thought the examination questions were adequately covered in lectures. They were in fact able to 'carry' their difficulties better than the weaker students. High achievers had fewer unspecified worries, were more confident of success, did not allow their non-academic difficulties to interfere with their work and had more favourable home study arrangements. They were less inclined to neglect subjects in which they thought they might fail, and they felt their families appreciated their difficulties. The two groups in Pond's study did not differ in the amount of time taken up with family problems and relationships. The high achievers seemed more aware of the importance of working during free periods, organising their time and making priorities of work and improving study techniques. The low achievers did not seem to understand or appreciate the need for these adjustments to university, and apparently assumed that what helped them to succeed at school would also be adequate for university work. The two groups differed little on reading ability although their IQ and matriculation scores were significantly different.

The high achievers also had better library techniques, revised lectures on the same day and were more ready to attend to pressing tasks. The low achievers tended to have more financial worries, or perhaps they were less capable of handling their finances. It may be that they were ineffectual in finance as well as study. Unless there are objective data on the actual funds they had, we can only speculate on that point. All these factors seem to suggest further ones. It may be for example that there is a social class factor at work where conditions of study and finance are concerned, and a schooling factor may be indicated by the apparent ineptitude of the failing group in their general approach to study.

Olsen[128] interviewed 80 failed students. Only nine students thought they knew the reasons for their failure. These were cases of serious illness and accident which prevented the students from attending lectures and there were some cases of impossible study conditions. Of the 71 remaining students who failed the causes most frequently cited were inability to cope with certain subjects mainly due to faulty lecturing, difficulties in budgeting time because no detailed syllabus was available to help in estimating time requirements, lack of knowledge of standards likely to be required, loss of interest, home worries, excessive travelling. It is interesting to note that several of the reasons given implied that the blame was attributable to people other than themselves. The validity of students' responses can be questioned because there would naturally be a certain amount of rationalisation involved as an ego defence mechanism; even so it is essential to take them seriously if our understanding of failing students is to be improved.

Other studies have confirmed Olsen's findings and given additional reasons for students' failure to do well. In Gray and Short's study [77] it appeared that some students had a lot to contend with at home. Some parents were indifferent if not hostile to the idea of higher education for their children and gave little co-operation to enable them to get on with their studies. Five per cent of parents in their sample were like this, and this in itself could make a considerable contribution to the amount of wastage among this group.

The extent of students' engagement in extra-curricular activities seemed to make little impact on students' academic progress except, for some reason, in the case of engineers. This might be explained by the need for engineers to keep up their laboratory and other practical work; by spreading their interests too widely their work may have been more directly affected than that of students in other studies, though it would appear that other groups could just as well be affected in this way.

Schonell's study produced a different bias of reasons given by students from those given by Gray and Short's sample. Schonell's failing sub-sample instanced their own ineffective study methods or not having spent enough time in study. Many also blamed university procedures, particularly the arrangement of courses and lecturing deficiencies, as well as personal and family factors, unsatisfactory lodgings and general dissatisfaction with university life.[78]

Loneliness and inability to make friends was also associated with failure. In Gray and Short's study [77] 11 per cent of failing students who had this problem performed very badly. Also of those who had transport problems only 39 per cent passed, compared with the other students of whom 60 per cent passed. The kind of travelling that caused most of the bother to students was movement between different parts of the university – not between home and campus. Of those complaining of this only 25 per cent passed; on three or four days each week they needed to travel between different parts of the university and they felt their poor performance was directly attributable to this.

Factorial Studies and Motivation

Factorial studies may be done by entering in the correlation matrix all items in the study including the criterion. Another method is to hold the criterion out of the factor analysis, factoring the remaining data, and then running correlations against the criterion. Olsen [126,127,128] adopted the former method in a comprehensive study of 250 freshmen students. He administered the B49 intelligence test, the mathematics sub-test of the E.T.S. scholastic aptitude battery, Valentine's Adult Reasoning test, vocabulary tests, a measure of strength of vocational choice, and the Bernreuter Inventory. In his factor analysis he included matriculation scores in humanities, mathematics and science subjects, and first year examination results.

The principal factors which emerged from the factor analysis were:–

(i) a Scholastic Attainment factor suggesting that a high pass in matriculation, the result of achievement in secondary school, appears to be not only a sound foundation for work in higher education, but also indirect evidence of personality traits necessary for further studies.

(ii) a Speed and Accuracy Factor, suggesting that a successful student is able to apply speedily and accurately the concepts he has learned, and to discriminate quickly between non-essential and essential details of the problem. (This is of value both in studies and in the examination situation);

(iii) an Introversion Factor, which suggested that some degree of introversion and lack of social participation characterised the successful group of students in the first year. This particular finding was similar to that of Furneaux** in his well known English study, which is now well validated;

(iv) a Mathematical Factor – but this was hardly surprising since 80 per cent of the sample were enrolled in science and technical faculties. It is less likely that this factor would emerge for a group of students in the humanities; this unfortunately was not tested. It would be of great interest to study other specific categories of students to see if similar factors would appear.

In another study of success and failure by Hammond[80] at the University of Melbourne, it was found that the conditions most positively associated with examination success were: amount of actual time students spent in study, use of the library, attendance at tutorials and seminars, effective planning of study time, and particularly the habit of taking part in small unsupervised discussion groups with fellow students. Clearly motivation must have played a large part in their success, these various activities being evidence of that motivation. However the activities themselves, especially discussion, should not be underrated, since motivation on its own without actual participation in these activities would not necessarily lead to success. This would be especially the case with those lonely students who do not feel able for some reason to join in the groups. Participation in informal sessions with their peers enable students, who take this kind of initiative, to cover the whole gamut of their field of study in a way that arranged seminars and lectures do not often permit.

Problems of Asian and other Students

Australia and New Zealand participate in the Colombo Plan which sponsors students from Singapore, Hong Kong, Malaysia, The Phillipines, Indonesia, Thailand, India, Pakistan, Burma, other Asian countries and the Pacific Islands. A large group of Asians study in Australia at their own expense. A few researchers have taken the opportunity to study their progress at the university.[107, 157] Coming as they do from widely diverse cultural backgrounds to an essentially European type of higher education, Asian students have some special problems. One of these is the language difficulty and they indeed start their higher education with a severe handicap. When they have been given IQ tests they have been found, as expected, to score very much lower than Australian students, averages being 124 for Australians and only 100 for Asians – a good example, if one were needed, of the handicap of taking a test in a foreign language. One might expect their university studies to be limited severely. Asians who passed their degrees had a mean IQ of 102, while those who failed had a mean of 95. Yet studies of their performance at the university have shown that Asians have been as successful as Australians. When it is realised that they are subject to severe stresses, such as social and emotional insecurity and isolation, their results are seen to be quite remarkable. A later study showed that reading scores bore an inconsistent relationship to their performance at the university. Keats found a correlation between their reading scores and first year commerce, and third year science, but almost a zero relation with first year science and third year commerce.

** W. D. Furneaux (1961) – *The Chosen Few.* Oxford University Press

Apart from the special problems experienced by Asian students, students in general have problems which are widely shared. Because of the great amount of drop-out or failure in the first year, more attention has usually been given to the problems of first year students and the transition from school to university. The need to help students once they have been selected is now more recognised. It is fairly common for researchers in Australia and New Zealand to follow up their findings on student failure by making recommendations for better student services, especially guidance and counselling. Ways of reducing failure and wastage by pre-university counselling to guide prospective students in making the most suitable choices that are open to them, by seeking the co-operation of their parents, and by counselling during their studies to help them over their difficulties are now recommended. They also make recommendations for more comprehensive guidance services in the schools to bridge the gap between school and university, or at least to introduce the elements of some bridging process where none yet exists. One part of Gray and Short's study indicated that about 3 or 4 per cent of their general sample, needed referral to a psychiatrist. A similar proportion in other countries is said to need this kind of help. There would be several times that proportion with less serious anxieties, but needing some degree of psychological assistance and support.

Priestley[144] produced a table showing the proportions of students requiring different kinds of help over a three year period. He found that 16 per cent of those coming to his office needed a greater or lesser amount of psychological help, while 48 per cent needed less specialised forms of counselling, the remaining 36 per cent needing minor assistance of a routine kind. In Gray and Short's experience, 20 per cent of all university entrants would need counselling at some level of sophistication, which would demand staffing by well-prepared professional people. Common sources of anxiety were: incompatibility between occupational or professional aspirations and the course they had undertaken or other apparent unsuitability of the course for particular students; home conflicts; loneliness and despair, especially among the Asians away from their own countries; inadequate intellectual ability and/or inadequate motivation for study, some students probably having reached their ceiling at high school. There is confirmation here of the need for more thorough counselling at the pre-university stage as well as in the university or college itself. In Australia and New Zealand there is ready acceptance of the need in higher education for special counselling services staffed by professionals. They have developed partly because of the absence of student health services, but also because the two are seen to be somewhat different in their purposes. The recent small but gradual growth in counselling services in Britain would seem to be recognition in a few places that a need exists for counselling in non-medical matters.

There have also been studies of the social class and educational background of students where it has been found, as in other countries, that those from middle class educated families do better than those from working class families. This has been attributed to the difficulty in adjusting to what is largely a middle class environment at the university. This is specially significant in Australia's case, where there is a largely egalitarian society. Upwards of 70 per cent of families own their own homes, and most secondary schools are high schools – fairly comprehensive in character. In spite of this, Schonell [178] found that 42 per cent of students in Queensland came from managerial, professional and semi-professional families although this group constituted only 8 per cent of the working population. Thus they were more than five times over-represented at the university. Working class students are seen as a special group who can be helped to adjust to university by effective counselling services. Compensatory assistance is needed to overcome weaknesses due to lack of support at home and the inability of their parents because of their lack of knowledge of higher education to assist the students to adjust.

Of students in Gray and Short's study,[77] 30 per cent felt themselves in need of guidance in study methods, reading improvement, and library techniques, and Anderson,[23] considered student counsellors were best able to help them in these problems because they did not represent any form of authority in the university. Anderson also advocated the provision of study centres for students who live in lodgings or at home. Here they could work on their own or with other students, with desks and places for books, small meeting rooms and a common room with facilities for tea and coffee making. The advantages of such student houses, very similar to those suggested by Sir Eric Ashby[29] and the study towers provided at the University of Essex**, are that they would provide a reasonable substitute for halls of residence for those students in unsatisfactory accommodation and would take a considerable load off the libraries.

Besides providing guidance in reading and study difficulties and in personal problems, there is a further way in which counsellors are seen to be in a good position to maximise the productivity of universities; they can help students to choose their courses from the whole range of possibilities. In Australia there is a special problem. Whereas in most British universities, it is generally assumed that students will apply for honours courses, and indeed the great majority of graduates are honours graduates as pointed out earlier, in Australia the pass degree is the one attempted by 90 per cent of students. The reason for this is not the academic quality of the candidates so much as custom. Although the general ability of Australian students is comparable with that of English students, only 10 to 15 per cent aspire to honours degrees, and only about 10 per cent of entrants achieve firsts or seconds. There are no thirds or fourths.

Anderson,[18] found in one of his studies that there were at least as many potential honours graduates on pass courses as on honours courses. The reasons they gave for not undertaking honours courses did not suggest low level of aspiration but rather a mistaken belief that they were not capable of achieving honours, and many of them did not even know of the availability of honours courses suitable to their interests. Counselling services manned by properly qualified people should be able to ensure that much of this outstanding talent does not go unrecognised.

In a recently published study of first year students in New Zealand, Small[183] has once more confirmed that low academic aptitude relative to the general student population was only a slight factor in academic success and failure, and not of sufficient predictive validity to indicate which individual students will not pass. After discussing the stability of student quality over years and the possibility of pass standards being changed deliberately or unwittingly in such a way as to nullify any improvement in the quality of students which might occur, Small argued for some form of assessment and guidance of students on the basis of their academic potential. In New Zealand as in Australian and American universities, students enrol for several courses in each year, mostly related components within a discipline though taught and examined separately. Small argued that by assessing students in ways which he proposes it would be possible to advise students whether in the light of their assessments they could achieve passes in all subjects, or whether it would not be better for them to take one or two subjects less than the maximum. By setting realistic goals in this way, and not expecting them all to accomplish as much as the most superior students in any given year, it may be possible to reduce failure. Certainly it should be possible to reduce the numbers of students occupying places in courses, some of which they would be bound to fail if under full load. This procedure would be simple in a flexible system, though it would

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** Clossick, Marie (1967) – *Student Residence – A New Approach at the University of Essex* London: Society for Research into Higher Education.

be less feasible in systems where courses have no distinct subject divisions and are supposed, sometimes perhaps unnecessarily, to be seen as a whole. Small also argued for closer liaison between schools and universities in ways to make the transition less difficult, and for elaboration of guidance services at the university, both in the formal sense and by involving the teaching staff, so that guidance was not merely used remedially, but as a measure to improve pass rates.

Resident and Non-Resident Students

Most students in Australian universities live at home or in accommodation off the campus, and the provision of halls of residence, or colleges, as they are customarily called there, has not been lavish. It has been more usual than in Britain for young people to live at home until marriage. This may be one of the reasons for the lack of student residences in higher education, though lack of financial provision is probably the primary reason.

There have been a few studies of the role of residence in student performance, and students' accommodation preferences. In Anderson and Priestley's study,[27] students in residence were generally found to perform better academically, though the researchers qualified this by pointing out that there was an element of selection by academic standing to some of the halls, and this would be expected to boost the general level of students in them when compared with non-residents. However, in one hall which did not select on academic criteria, and included as a matter of policy many students from rural and country high schools – generally known in Australia to be a vulnerable group – the standard of performance was as high as in other halls or colleges, and in some years it was even better. The researchers suggested that the main factor producing the differences between hall residents and lodgers was probably not one of physical comfort and facilities because most of the lodgings were reasonably good and sometimes even better in the physical sense. The differences were more likely to be related to the degree of social integration achieved by the different groups of students. The country students were seen to be specially vulnerable to loneliness and isolation when living in lodgings, and all lodgers were more likely to do poor academic work. They were also able to obtain medical services less readily than those in halls. In Australia there is little that is equivalent to the Student Health Services in British universities or the National Health Service. (Health benefits are dependent on voluntary contributions to private schemes).

Although Australian researchers refer to the integration that residence makes possible, they have not explored in detail the precise nature of the interaction that brings integration about. Nor have they studied in detail the social structures existing in the different halls which are associated with the varying degrees and forms of integration. More thought has been concerned with the kinds of assistance to students which can be given in halls of residence and colleges, and the degree of quietness and freedom to study which halls do or do not enable students to enjoy. Schonell[178] et al studied the academic performance of residents and others, and found that women non-residents performed significantly better than residents. Men students who were not resident also performed better than residents though the difference was not statistically significant. Their study suggested that any superiority among residents may be related to continuity of residence and the availability of adequate tutorial assistance, and they thought that without such assistance study conditions in colleges may even be inferior to those of home or good lodgings, particularly with regard to freedom from distraction. As the authors point out the problem requires much more detailed investigation with larger samples and proper controls.

One other study by a Senate Committee at the University of Sydney[194] in fact

showed that 30 per cent of residents were bothered by distractions, particularly noise and interruptions, in their halls, while in lodgings the proportion was only 25 per cent, and of students living at home and elsewhere it was even less – 20 per cent. General satisfaction with accommodation was highest among students living at home and in residence halls, distance from the university being their main source of dissatisfaction. In a similar study at the University of Queensland it was found that although residence with parents or relatives was highly regarded by all groups of students, there was nevertheless a preference for independent accommodation, especially self-contained flats. Hostel and boarding house residence were low on the list of preferences.

So far there have not been sufficiently comprehensive or detailed studies of the advantages and disadvantages of different forms of residence on the general and academic education of students, or the years in which it is preferable to give scarce residential places to students. Is it for example preferable that students should spend first, second or third year as residents? Some colleges believe that first year students should live out, so that the corporate life within the hall will be enhanced by a continuity of residence by students in their second and third years.

However, a small study by Langley[108] strongly suggests that so far as academic performance is concerned, it is preferable for first year students to live in hall. Her findings are of great interest and her study could easily be replicated in different kinds of halls to see how far they apply in other universities. Langley studied the pass/fail ratios of students living in different kinds of accommodation in different years, and found that first year students living in college or hall did better academically than those living at home or in lodgings. By contrast, second and third year students living in halls did less well than home based students. Students in lodgings did less well in first and second years at university than students at home or in hall. Possibly the most interesting finding was that third year students in lodgings performed better academically than students living at home or in hall. It seems therefore that residence in hall is most important in the first year when students are least mature and are in the throes of adjusting to the new life of the university. In third year at the university when students are more mature, more knowledgeable about how to find satisfactory independent accommodation and how to select suitable colleagues to live with and are better able to organise their studies and balance them with social life, it seems then that for more mature students the independence of life in lodgings is more appropriate. It may also be that those students who prefer to remain in halls or at home in their third year are overdependent and less capable of study than their contemporaries who prefer lodgings. These are a few of the possible interpretations. The research is much in need of replication because this is clearly an important issue in times of shrinking student residential resources, and if student preformance can be affected by such a simple device as differential allocation of residential places to students according to year of study, policies of admission to halls should be adjusted to ensure that the effect is in the right direction.

A study by Ryan[149] of Catholic students showed that the academic advantages of being in Catholic halls of residence were only marginally better than the provision of tutorials for students. Since residential places are too expensive to be practical for all students, it seems that the provision of tutorials and some form of counselling are a practical alternative.

In a thorough examination of the relative academic progress of students living in different kinds of accommodation, Parkyn [130, 131] found no statistically significant differences in overall performance, the main differences being between years and between sexes; though even they seemed only chance differences. It may well be that special

facilities will be more than adequate to compensate for the lack of opportunity to live in halls of residence. The facilities should include tutorials, counselling, and study places where students can move in and work continuously and if they wish make coffee and discuss their work together. These are examples of compensatory measures which can be taken, and which will benefit not only those deprived of residential places, but those who would be living at home or in lodgings anyhow. Such research as there exists suggests confirmation of the worth of proposals of these kinds.

Types of Schools Attended

The kind of school attended before coming to university can have a lasting effect upon students' chances of success at the university. Hohne[90] found that the type of school a student attended can affect his standard of achievement in higher studies, and Sanders' later work supported this.[160, 161] In Flecker's study[69] of mathematics students in several faculties, he found that a disproportionate number of failing students came from one particular high school. It could easily be said that the children were badly taught, but that would not convey much meaning unless a further question were asked about the *kind* of teaching which is supposed to be bad, and the climate or general character of the school.

In Schonell's study[178] students from different kinds of schools were studied with reference to the prevailing *milieu* or ethos in those schools. The schools were categorised into four types, differentiated mainly by their teaching techniques, discipline and atmosphere. In one type of school, there was a bias towards rote learning of facts and ideas, the pupils' work was set out in note form prepared by the teacher to be learned by heart; they were frequently tested, were often required to complete set examples, and there was a general authoritarian atmosphere. In schools at the other extreme, there was considerable freedom for pupils to be interested in a wide range of materials, the work was not nearly so directly geared to the matriculation requirements, teachers encouraged their pupils to think and to express themselves critically and to make their own decisions about their approach to their studies. Generally, the teachers tended to be permissive, or at least democratic. In their preparation for one subject, English, at matriculation level, teachers in schools of the latter type did little beyond advising the pupils of some of the main areas to be studied. Detailed reading of the texts, note taking and other writing was done mostly by pupils using their own initiative, and teachers acted largely as consultants, available when the pupils needed them.

In the directive schools, teachers took their pupils through texts in great detail, explaining even minor points, dictating notes, and they gave pupils practice on specific examination questions. Pupils were given little opportunity to work through problems in their own way, they were accustomed to looking for 'right' answers and their interests were never expected to range widely. In the matriculation examinations students from the directive schools performed significantly better, at the ·01 probability level, and therefore may well have gained a greater number of places at the university than those from the more liberally run schools.

This might seem a triumph for the rigid didactic type of school if the research ended there, but it was also found that in first year performance at the university the students from these schools who did so well in matriculation examinations did not do as well as the students from the liberally run schools. This is important in the further sense that having done well in the first year, the chances of graduation for those from the liberal schools were very high, since first year results are a more valid predictor of final examination performance than are matriculation results.

This finding poses a dilemma for teachers, parents and pupils. Is it wise for teachers to use over-directive methods in order to get their pupils university places at the risk of their not doing so well after they are accepted? Or is it preferable to use liberal teaching methods and so take an element of risk about whether a place is initially gained, in the hope that once in the university good use will be made of the place gained? Educationally there should be no choice, but many teachers pupils and parents will prefer to be 'practical' and aim for good school marks whatever the means since it is of little immediate advantage to prepare a pupil for higher education if he is to be denied a place on the criterion of school results. This suggests there is something wrong with university selection methods that we have not yet discussed. This is a field for further research, though a good argument can certainly be made from Schonell's findings alone for an immediate amendment to selection procedures which rest heavily on standard of school attainment.

The most important conclusion from Schonell's study is that techniques of teaching which have a broad open approach to learning prepare better for the university, even though the payoff in terms of gaining proper entrance qualifications is less in the immediate sense. While a regimented school appears to achieve more in gaining its pupils places in higher education they tend at the same time to handicap them in their powers of adjustment to the university. It would be valuable to replicate this study in British universities to assess the implications for sixth form studies and university entrance. In Schonell's judgment, as a vice-chancellor with a long and distinguished career in the field of education at all levels, schools with liberal, balanced attitudes towards teaching and education teach pupils intellectual self-reliance, give them a chance to develop their own powers of adjustment and ability to organise their time and study, and to learn to strike a balance between work and leisure. Students from regimented schools tend to take longer to adjust to the university. If they fail first year examinations the prognosis is not good for the second and third years, and they are then subject to the impact of failure and loss of self-confidence. This may help to explain the tendency found by Hohne[90] in his early study in which students from certain schools were particularly subject to maladjustment at the university.

Summary

Most of the Australian and New Zealand research into higher education has been addressed to the problem of wastage and failure, and a fairly consistent picture has emerged from the work done in both countries.

The main areas explored have been the following: student selection, personality and social factors, academic ability, age and maturity of students, student residence, the reasons students give for lack of success, the doubtful advantages of repeating sixth form studies in the same subject, pass/fail ratios, examination criteria and methods, study methods, student problems, transition from school to university, guidance and counselling. For countries having small populations, relatively few universities and small research resources much significant research has been accomplished.

If a general conclusion can be drawn from the Australian and New Zealand research, it would probably be that a fairly open system of entry is desirable if young people are to be given the educational opportunities they want and deserve. Selection can be improved, but since it is subject to considerable error, it is best to allow a wider range of ability to enter higher education. Students' motivational and other non-intellective characteristics can then be put to the test in the first year. These qualities are probably more related to the success of high ability groups than mere academic ability as measured by school examination results. There is much greater predictive validity from first year to final degree examination results.

A corollary of this is that in order to maximise the potential of candidates, universities have a responsibility to help students in every possible way to succeed. The emphasis then should be not so much on selection as on teaching and guidance. Guidance and counselling offices manned by properly qualified professionals are widely recognised in Australia and New Zealand as a means of promoting students' academic success as well as helping students with psychological and social problems.

Because of the relative inconsistency of the relationship between matriculation results and the first year examination results, Schonell made a bold suggestion – one which is viable in a prosperous country with a rapid growth rate like Australia, and capable of modification for less prosperous countries. Schonell suggested that one solution for the problem of selection is to select them all – or nearly all. He was referring to the Murray Report on Australian higher education (1957),[125] which concluded that the demand for graduates was so great that rather than seek to make a more rigorous selection of students, universities should be put in the position to accept all those qualified and who wish to enter, and to give them the teaching and other facilities which would ensure each of them a reasonable opportunity to pass from first to second year and through to graduation.

Open access to higher education is too costly for any country where all students have grants, and where courses are arranged rigidly as one piece. In Britain with a highly selected intake and costly grants system, it is too expensive to increase the student population without limit. In Australia and New Zealand fewer students receive grants, and courses are usually broken down into units, as described in the opening paragraphs of this monograph. Selection does not appear to be as rigorous as in Britain. If a wider range of ability were allowed to enter first year courses it would be possible to give a fighting chance to the highly motivated though *apparently* less able candidates, who might have been rejected in a less open system. In Australia and New Zealand a second chance is generally possible in individual subjects, while credits can be carried over until the failed subject is passed. Grants are often suspended until this is done and are then renewed. There is thus minimal disruption to a student's progress. Although the opportunity for part-time study of this kind is an advantage to the student in making possible the opportunity to continue, and beneficial for the system in minimising wastage, part time higher education as a general principle is less well supported, since it is regarded as inefficient. Part time students tend to come from lower income groups. If grants were made available to the more highly motivated individuals among these groups to enable them to engage in full time studies, except when they needed to make good a failed subject, overall efficiency of universities could be enhanced. Although part-time study is not efficient and grants are generally thought to be too few in number and not adequate, the flexibility of the system does keep opportunity open for students who find difficulty in securing grants, yet are highly enough motivated to work their way through university, even though wastage may be high.

It is regrettable that owing to the British system of integrated three year courses tied to costly grants this procedure could not be applied without major changes.

The study of first year university performance has been seen by most Australian and New Zealand researchers as the key to the problem of academic performance as a whole because this is the year when students are really put to the test. School results cannot predict accurately which students will do well or poorly. Factors related to personality, motivation and the kind of preparation students have received at school appear to be more important than school grades though prediction based on those factors is not adequate either. Prediction from first year results to final degree results is more accurate, probably because first year results are a measure of students' response to the university.

An outline of the problem of first year failure in Australian universities is given in a paper by Professor Sanders, a summary of which is published as an appendix to this monograph. It includes suggestions for future research in this field arising out of the Australian research up to 1960. Though ten years have elapsed since then, the picture has changed little. Recent studies have confirmed Sanders' main ideas, and the research problems suggested by him are just as relevant now as then, though others could certainly be added.

PART II. DEVELOPING PATTERNS OF RESEARCH

The first part of this monograph has shown that most of the research in Australia and New Zealand has been concerned with success and failure, selection and wastage. In the past decade there has been a gradual change of emphasis to the more general aspects of student progress, which include studies of the institutions themselves, examination, teaching, professionalisation of students, particular professions, students' perceptions of their courses, staff-student relations, opportunity in higher education, and comparative, historical and administrative studies. Although the present volume of research in any one of these fields is small, with maybe only a solitary study in any one field, there is an expanding awareness of research problems in higher education which are more fundamental than studies of selection and academic performance. The problem of success and failure has certainly not been abandoned, and some of these new type studies are still related to it.

Teaching, Staff Student Relations, Values

In recent years teaching at universities has been closely studied in the realization that the success or failure of students is closely linked to standards of teaching. Initiatives usually come from professors and lecturers seeking ways to increase their own effectiveness and that of their departments. Two of the offices established for this purpose are at the University of New South Wales and the University of Melbourne.

The University of Western Australia is also establishing a new unit. The work of these offices has been concerned primarily with action research in which the persons involved are seeking to improve their methods and approaches to teaching, rather than with the kind of fundamental scientific research that is more feasible in other educational problems. The emphasis is on consultation, exploration and practice, at the departmental, faculty and individual lecturer levels. The problems tackled by the teaching consultants necessarily overlap with problems of examining and course organization. In some instances course evaluation is attempted by the study of students' attitudes and opinions. While these are only one set of criteria of the value of a course which can be applied when seeking to improve teaching and learning and modifying course arrangements, it is thought to be an aspect that should not be disregarded.

In Schonell's study, students were asked about their reasons for difficulty in study, and in only 11·2 per cent of the cases did students blame the lecturers because they were either uninteresting, difficult to understand or otherwise incompetent. The main complaints of this minority were that, lecturers were incoherent, too much or too little detail was given so as to cause confusion, lecturers were unable to communicate at the students' level, poor delivery (too quickly, too softly, to the blackboard, or with an accent), lecturers were dull or uninspiring, and writing or diagrams given were illegible. Only 9·8 per cent of the students who passed their examinations made these criticisms, but failing students in 13·5 per cent of cases.

Tutorials and small group seminars were favoured by the greater proportion of students. Sixty seven per cent thought they were helpful, and 22 per cent disagreed. The main student criticisms were that some tutors lacked the personality or technique necessary to make them successful, topics were not specific enough, and they felt they had to spend too much time preparing for them. They felt their courses were already overcrowded and there was not

enough time for tutorials. These criticisms reflect upon the students themselves to some extent, because they suggest that they were not prepared to approach their studies in a broad manner and to do the home work necessary for successful tutorials. However, these criticisms may also reflect upon the teaching for it seems that students may have had too many formal classes. A further criticism was that there were often pointless arguments by some members of the tutorial groups who merely liked to talk to impress, which suggests that the seminar leaders were at fault in not being able to control the focus of discussion. Students themselves suggested improvements to tutorials, for example: topics should be prepared in advance, tutorials should be arranged for different ability levels, the leader should be able to answer questions, there should be a maximum of 15 students in each group, and tutorials of not more than an hour in duration. In addition they should be informal and well prepared by the students themselves, should not follow the lecture material too closely, and the leader should guide the discussion and not be directive.

In 1965, the Australian Vice-Chancellors Committee published a report of a survey of teaching methods in Australian universities.[36] Heads of departments were the main respondents, of which there was a total of 320, from the faculties of arts, law, science, medicine, engineering, dentistry, veterinary science, agriculture, economics, and architecture. The survey investigated the following areas:

(i) the responsibilities of the university teachers,

(ii) general problems of teaching, including accommodation, staffing, the library as an instrument of teaching; problems of transition from school to university and from year to year, determination of students' work load, student progress; the use of vacations,

(iii) levels of teaching – weaker students, the normal pass students, honours students, the structure of honours courses, objectives and content of honours courses, the degree of specialisation in honours courses, teaching methods in honours courses, the numbers of honours students, the graduate student,

(iv) types of teaching, including the general pattern of university teaching, the lecture and ancillaries to the lecture such as provision of duplicated notes, textbooks, the tutorial and the practical class, the assignment, audio-visual aids, informal contacts with students, teaching for independence.

The report was described by the committee members as a preliminary and impressionistic inquiry, which it is, in the sense that there is little attempt to quantify the enormous amount of data which must have been received. However, it is a substantial report, and contains a large number of conclusions and recommendations, which, although specific to Australian universities are worthy of inspection and use as a framework for research and discussion of teaching. The report concluded that teaching ability ought to be considered as of major importance in making appointments together with the other qualifications of candidates, active efforts should be made to introduce training courses for new lecturers and increased emphasis should be placed on small class teaching and graduate studies. Libraries should be staffed by people capable of guiding the independent learning of students. It was recommended also that teachers should make greater efforts to understand and help students in the transition from school to university and students should be frequently informed of their academic progress to guide them in their distribution of effort. There should be greater discussion among teachers about their responsibility towards weaker students, and follow-up studies to assess the impact of university studies upon students and graduates. Training in university teaching methods should be provided for graduate students. Departments should pool their knowledge and experience of teaching. Qualified part-time staff should be used to assess the completed assignments of students and there should be an inquiry into university examinations with particular exploration of the relations between assignments and formal

examinations. The committee expressed concern about the possible diminution of staff interest in ordinary students as the graduate schools expanded, and the impact of these graduate schools on the general pattern of university teaching. Finally the committee was concerned that teachers should be encouraged to motivate graduates to continue their own education after leaving the university, and be capable of exercising initiative in investigating new problems and seeking solutions.

Connor[53] of the University of New South Wales reviewed thirty-four well designed studies of university teaching. Although they were not original researches by Connor, the main conclusions reached are worth reporting. Experimentation in teaching is hard to put on a firm scientific basis, the matched group technique can at least be used to control some of the more obvious variables at work in a university teaching situation.

After allowing for the unlikelihood that all variables could be controlled and the methodological shortcomings of even this carefully selected group of studies, Connor thought the following generalisations could be made. In many situations students can be taught in large groups just as well or even more effectively and economically than in small groups. Indeed the size of the group becomes relevant only when a procedure or media inappropriate to the size of the group is adopted. Lecturing to large groups is appropriate and even essential where the purpose is to present material systematically, to raise principles or to present a topic and stimulate interest and enthusiasm for independent study. Discussions, seminars, tutorials and other 'small group' methods are generally superior to lectures for consolidating and integrating information and concepts, and for applying concepts and principles to practice, much depends on the teacher's skill, but whatever the method of teaching used, perhaps the most productive approach is to regard the tutorial session as a 'problem-solving time' in which an attitude of inquiry is encouraged and developed. Arbitrary and specific directioning of students is as inferior an approach to teaching as lack of any direction, because one of the goals of university teaching is to minimise the students' dependence on the teacher.

The studies on laboratory teaching methods suggest the placing of greater emphasis on creating habits of independent inquiry and problem solving rather than on mere demonstration of conventional laboratory experiments. The studies confirm that there is no one method that is most effective for all teachers, student situations and academic subjects. Choice of method is best decided by reference to the *objective* to be achieved, the size and background of the student group, the personality and skill of the lecturer, and the preferences of the lecturer and students for any particular method.

Maclaine[110] also made a review of literature on teaching methods and drew similar conclusions to those of Connor, adding the point that the technique of teaching used was probably of less importance than the person using it, there were positive gains to be had from teaching large numbers, even up to 500, provided the standard of lecturing was high and was supplemented with small group tutorials or seminars. One advantage of large lectures is that the best teachers can be put into contact with a greater proportion of the students. Any gains which might be made by splitting large groups of students into smaller groups could well be lost if the lecturers taking the smaller groups were mediocre or bad. However, it was not suggested that students do not require any more than such remote confrontations with their teachers. Connor's and Maclaine's reviews are cited as examples of the value of secondary research when original research is beyond the resources of a person or department. There is no evidence that the suggestions for future research are being pursued in Australia or New Zealand except incidentally in the context of other studies. Workers in these countries are concentrating more on action research and development in individual

departments and disciplines, which seems appropriate when research resources are not abundant.

The study of teaching borders on course structure and integration, and this is clearly shown by Short, Gawne and Wheen's[182] studies at the University of New South Wales. Where the teaching load was spread between a number of lecturers, students commented that there was too much repetition of the same material within each section of the course, and that there was too much detailed emphasis on specialist topics with the fuller context of the course being overlooked. This is, in part, a matter for the course controller, but there is also a need on the part of individual teachers for continuing awareness of the material being taught by their colleagues.

Teaching is also bound up with staff-student relations generally, and non-cognitive changes in students as they pass through higher education may be of greater account than the cognitive changes. This is a large field of research in which little has been done in Australia or New Zealand. Mitchell at the University of Canterbury, New Zealand[119] conducted a postal questionnaire study of student opinion regarding staff-student relations among a student population of 4,450 students. Some 460 students responded to the questionnaire which was analysed according to sex, faculty and whether students were full or part time. As Mitchell points out, a university of this size has the intimate characteristics of a small university and the impersonal efficiency of a large one. Although the staff student ratio was 1: 12 most of the staff and students lived in their own houses away from the campus, and according to Mitchell, the physical arrangements of the university did not facilitate staff student contacts. Most of the students had at least 15 hours per week of formal contact with staff in lectures, laboratory sessions or group tutorials, but they thought staff were not accessible enough for the occasional consultation which they deemed necessary to the furthering of their studies.

Nearly all students felt that the formal contacts with the staff should be supplemented with more informal and casual personal contacts. There was little difference between the opinions of the sexes or between part-time and full-time students, but the more senior students placed more importance on such contacts than new students. However, only 13 per cent thought that mainly social contacts were very desirable, it seemed that most students favoured them as a means of bridging gaps in the formal relationships, rather than as purely social. Sixty-six per cent thought there were too few informal contacts, yet only 10 per cent had no such informal contacts, which seems to have been an unusually good state of affairs. The poor achievers and failing students tended to have seen less of staff informally than the more successful ones. Only 13 per cent of students had visited the homes of staff members, most of the contacts having been made in the university departments with the teachers in their own subjects of study. Some staff adopted the practice of putting on morning teas for senior students. Although this was possible in a medium size university, Mitchell predicted deterioration as the university grew in size. Apart from the fact that students consider greater accessibility of staff desirable, considerations of the effects of greater or lesser contact are largely subjective. Research into the nature, extent and effects of increased contacts or of deprivation is necessary.

In contrast with the largely non-residential University of Canterbury in New Zealand, the University of New England in Australia is residential except for external students. A comprehensive study there of student progress by Katz, Katz and Olphert[102] included academic performance, attitude changes, family and peer relations, club membership, and attitudes to staff and university education. Among the instruments used were scales of anxiety, values, ethnocentrism, dogmatism, worldmindedness, rigidity, political and economic

conservatism, study habits and attitudes. One object of general studies of student progress is to give indications whether the university or college is providing an environment which promotes the objectives of higher education, however these may be interpreted. Probably more than anything else, this study of the University of New England causes the reader to question the value of close community living.

The study showed that the student intake was homogeneous in social values and origins, and that coming into a fully residential university tended to reinforce or maintain some of the political and religious values with which they came. The student sample studied was fairly static sub-culture. There was little if any change over a three year period in attitudes to political and economic questions, they remained contradictory within themselves and relatively unformulated. But there were reassuring changes in some of the students' attitudes over the three year period with students progressively becoming less dogmatic, less authoritarian, and more tolerant. Their scores on a rigidity test diminished, suggesting greater flexibility of thought. These changes are usually held to be the goal of universities, but there is the question of how many of these changes can be attributed to maturational influences. To ascertain this, there should be comparative studies, which include control groups of similar young people who did not enter higher education, but chose banking, commerce, industry, civil service and other occupations.

Studies of student progress in the broader sense appear to be increasing in number and scope, and promise to be more productive now that the specific problems of practical concern such as selection, wastage and other areas related to performance have been carefully studied. Many inferences for administration and planning can be drawn from such research as has already been done. Some graduate students are becoming interested in this newer type of study. For example, Little, in a doctoral study, at the Australian National University is investigating a sample of Arts and Science students to discover how the experience of higher education affects them, similar to the British study of 1964 by Marris.** Few studies are being conducted within the confines of any one discipline. There appears to be an acceptance among Australian and New Zealand researchers that effective investigation into educational problems can not be suitably approached within the limited frame work of any one discipline, a recognition of the fact that educational research requires a multi-disciplinary approach.

Examinations – Criteria and Pass Rates

In much of the dialogue on student performance, and even in research, there has been an apparent reluctance to appreciate that however teaching be improved, selection procedures refined, the reliability of examinations improved, the quality of the student intake raised, and the counselling and guidance services provided, the performance of students – in terms of the examination marks they receive and the percentages of students passed, failed or given honours – will depend upon *policies on pass rates within individual departments and the reliability of marking.* In Australia Hohne and Sanders have for many years made this point, but despite this, reluctance to discuss it in the Australian, New Zealand and English literature has persisted.[87, 165, 169]

It may be that objective type examinations are not thought to be feasible for some subjects, especially arts subjects, but recently there has grown a franker recognition that examination marking is often largely subjective, and there are some attempts to assess the reliability of examinations and inter-tutor reliability. A few years ago F. W. Mitchell,[121] at the University of Otago, New Zealand, studied the reliability of examinations in four major

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** Marris, Peter (1964) – *The Experience of Higher Education.* London Routledge and Kegan Paul

subjects in each of two faculties over a period of seven years, and the variablility of results from year to year. Mitchell found that reliability coefficients were remarkably high over the seven year period if allowance were made for attenuation due to progressive selection of students as they completed examinations and the necessary divergence of content from year to year.

The pass/fail criterion and its fluctuations were also examined by Mitchell over a period of time. His results suggest that the setting of the mark between 'pass' and 'fail' is made independently of the ranking of students and is unrelated to the reliability of examinations. Although examination assessments and pass standards can never be absolute, this seems to confirm both Hohne's claim of 20 years ago that there is an element of arbitrariness in setting the pass mark and the point made by the Robbins Committee that there seems to be in some universities a custom that a certain percentage of students will be failed.** But in Mitchell's study there was quite erratic variation in failure rates from subject to subject and from year to year and if there was any arbitrariness involved it was difficult to see how and why it occurred. The advantages of understanding more about the disparity between departments and institutions' pass/fail ratios and the fluctuation from year to year within each department is obvious. It may be related to chance factors, to genuine variability among students, the relative difficulty of the subject, the teaching or the examining. It is hard to foresee much progress being made until there are more objective assessments of these and other possible factors.

Some Australian universities are making energetic efforts to improve objectivity in examinations, to eliminate unnecessary subjectivity and to reduce random fluctuations in pass rates. For example, for more than a decade the University of Queensland[196] has regularly analysed pass rates, looked into the relation between examinations and courses, studied the nature and format of the final examination paper, and the systems of different departments in setting grades and distinguishing between classes of student (honours, distinction, pass, fail). Efforts have been made to keep standards constant from year to year, and to study the feasibility of increased assessment during the year in addition to or partly in lieu of finals.

After assessing examinations as a cause of failure, Parkyn[131] drew several interesting conclusions. He recognised that some examiners feel they have a clear conception of the absolute quality of an answer they will accept as satisfactory. But he very clearly exposed how even slight error on the part of examiners could affect the pass/fail ratio quite radically. At the time of his research the average failure rate for full time students was 33 per cent. He reasoned that assuming a normal curve and a standard deviation of 10 marks, *a shift in the pass standard of only four marks could mean the difference between success and failure for about 16–17 per cent of all students in a class,* because of the fine differences between the students clustering about the mean. Shifts in the pass standard of greater than 4 subjective marks are of course very possible, in which case the pass/fail ratio could be affected by more than 20 per cent.

In the absence of completely objective criteria, Parkyn suggested that examiners should retain their own usual standards in judging the quality of their students' work and then modify the actual pass rate to take account of the effects of fluctuation in performance, unreliability of examinations and the difficulty in judging the importance of small differences of quality. This need not lead to continuing regressive pushing down of the pass/fail line, because the further from the mean the greater the differences between the quality of the

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** See Robbins Report on Higher Education. Cmnd. 2154, para 580.

papers, and therefore fine judgements are less necessary. He was of course writing of a situation in which up to 50 per cent of students were being failed. The fine discriminations about the mean which would be required to make accurate assessments in that sort of situation are probably not humanly possible. Hohne[87] in Australia in the 1940's created some rumblings in universities when he produced his research findings on the academic progress of university students in the science and arts faculties at the University of Melbourne. He pointed out that when the standard of entry was raised as a wartime measure to reduce wastage, no change occurred in the proportions of students passing their examinations. Later research and observation, by several other Australian educationalists and researchers supported Hohne, and Vernon** drew attention to the same problem in Britain. In the United States the stability of pass rates has been well recognised for many years, but the differences in pass rates between faculties and institutions in Britain cited in the Robbins Report (para. 578 ff.) suggest the existence of 'policies' on pass rates which may well be unconscious. It is also possible that they are deliberately imposed for unscientific reasons such as adherence to the normal curve when dealing with a selected group.

These matters may be provocative, and they deserve to be studied at departmental level, since any modification of practice in universities and colleges intended to reduce wastage and failure will be vitiated unless policies on pass rates are carefully considered and if necessary changed. Sanders[159] wrote, *"No amount of improvement in the entering student body will guarantee a higher university pass rate unless the staff, having reviewed the circumstances allows the change"*, and Hogben[85] after a study of 376 first year medical students called for a thorough investigation of course objectives and teaching and examining procedures as a pre-requisite to establishing appropriate pass rates for each years' intake of students. Hughes also made a similar point in his analysis of academic achievement at the university[97] when he wrote, *"The assumption of a given objective pass mark, irrespective of the quality of entrants, needs to be examined. Experience throws doubts on this point, indicating that where the quality of students entering is raised, there is a strong tendency for the examining standard at the end of the year to be raised. Thus while raising the entrance standards will certainly exclude present successes, it is not at all certain that it will produce rises in the pass rate".*

Hughes looked at the problem in simple economic terms. If as in the case of his own university 40 per cent of the expenditure of the university in connection with students did not contribute to the gaining of a degree, and since the degree is usually the purpose of the matriculated student, and the university's seal of approval of the standard reached in a given course, then to that extent the proportion of expenditure not contributing to the number of degrees awarded may be regarded as waste. It is also waste in a less direct though perhaps more essential way: that the function of a university in research and critical scholarship is seriously hampered by the extra demands on staff and funds for no measurable results. Hughes emphasised the importance of locating the causes of failure and delay as a first step towards identifying possible areas for improvement. While agreeing that failure and delay of students might be a means of raising or maintaining standards, he emphasised that the validity of this could be established only by careful investigation and not by discussion lacking factual basis.

An example of the kind of question to be explored is that by Gray and Short[77] whose work suggested that some examiners in the absence of any absolute marking standard,

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** See Vernon, P. E. (1963) – "Pool of Ability," in Halmos, P. *Sociological Review Monograph No. 7.* University of Keele.

tend to mark students relative to some standard distribution each year. So long as any device, such as the normal curve, is applied for grading examinees, which it sometimes is – quite unrealistically since university students lie at the top end of the normal curve – no improvement is possible in pass rates. So long as subjectivity in examining is present there is double error in relying on a device like the normal curve.

Dunstan[62, 63] set out other sources of error in examination marking, among them, the suitability of the form of the question for testing the students' knowledge, examiners' acuity as influenced by fatigue and by competence in the subject examined, differences in style between examination candidates and their differential appeal to different examiners. These sources of error suggest a need for examiners to try objective tests in one form or another. Dunstan's paper includes a discussion of the disadvantages of such tests and attempts to rectify these.

Fensham[68] examined first year chemistry students using criteria based on Bloom's taxonomy of educational objectives, which divides into six major classes of educational objective: knowledge; recall of material directly taught; comprehension, understanding of the material and application in a new situation; analysis and breakdown into detail; synthesis, assembly of previously learned material to create something new; and evaluation, involving judgements using undefined criteria about values. Fensham constructed a chemistry paper to cover all six classes of criteria, and used it to examine 150 students. The examination yielded no differences in the pass/fail rates compared with the customary method of assessment, but considerable differences occurred in the number of honours grades awarded. Twenty-five students were awarded honours by the ordinary grading and 40 using the taxonomic method. In student performance Fensham's study demonstrates the importance of the validity of examinations – the extent to which an examination tests the students' ability or knowledge which it is supposed to measure; and their reliability – the extent to which they are consistent and accurate (and enable examiners to be accurate in their assessment). The study further demonstrates that customary examination procedures can be questioned, and it provides an example of how examinations could be made more valid and objective. The method could be used for less objective material than that of science, but it appears to be a procedure almost unexplored in the literature on examining.

Gray and Short's work showed that there was a tendency for examination marking to depend too exclusively on lower cognitive criteria – level of knowledge retention – rather than higher cognitive criteria of understanding, analysis, synthesis, organisation and evaluation. It is easier to set and to mark examination papers which test only the lower orders of learning in Bloom's scheme, such as knowledge retention, but Fensham's paper suggests that the possibilities for objective examining using a wider range of criteria are greater than is often thought.

Studies of Professionalisation.

The research on the professionalisation of students studying different disciplines has been influenced by some earlier work of Paul Heist and associates at the Center for Research and Development in Higher Education, Berkeley, University of California. It is known that student characteristics vary from faculty to faculty, and students are guided in their choice of faculty by images which they have of the professions, balanced by the student's own self image. For example, it appears from some earlier studies that engineering and dentistry students are most alike in their tendency towards materialistic and utilitarian motivation. Dental students tend to be lower on a scale of theoretical orientation, while students of medicine and law tend to have personality profiles quite different from

engineering and dental groups. They have higher humanitarian values, but medical students are less anxious and less cynical than law students. These are the American findings and do not necessarily describe their counterparts in any other country or at any other time; however, they do confirm that differences may be found between students pursuing different studies. It may also be that they are being moulded by their studies in ways peculiar to the professions for which they are preparing. Studies of the professionalisation of students are helpful to academics to enable them to assess whether they are achieving the aims and objectives of courses.

A current study of the professionalisation and socialisation of students by Anderson and Western[26] at the Australian National University includes an assessment of the development of professional values and attitudes of students in several disciplines. This research attempts to discover when and how students acquire the values and attitudes which characterise their profession, and studies the cultures of five professions at six universities. Students are being tested at the beginning of their courses and at later stages. Withdrawals will be studied as a separate group.

It is too soon for all the data from the study to be analysed, but the initial results show that there may be factors, external to the impact of the curriculum and the staff, which are major determinants in the transition from first year student to practitioner. First there is the greater or lesser social class bias in the intake entering different courses. Law and medical students tend to come from richer middle class families than entrants to teaching, while entrants to engineering and dentistry courses stand in an intermediate position. Dentistry has fewer candidates from either manual working class families or upper professional or managerial groups than engineering, which recruited students from all groups.

So far the Australian findings resemble the American, showing definite differences in attitudes of students entering the various faculties. For example, compared with student engineers and dentists, those entering law faculties are on average less dogmatic, less conservative, more tolerant of divergent views, more interested in ideas and more active in the arts. The researchers suggest that these differences may originate earlier in school studies, when student lawyers probably had more experience in critical thinking about a wide range of problems and topics in the humanities and social sciences than dentists and engineers who spent more of their energies in coming to terms with and memorising the more precise and factual knowledge of school science and mathematics. Further preliminary findings show that engineering students tend, more than law or dental students, to be interested in the subject matter of their studies and less interested in status, financial reward and (in the case of lawyers) opportunities for political and other more general careers.

The early decisions of the Melbourne students to enter certain courses are similar to those of students at the University of New England (Australia) – a very different type of university with a more rural and homogeneous catchment area. This suggests that Australian students, whatever their origins, seem to be more frankly oriented to professional objectives in their studies than in Britain, where it is apparently more fashionable for students to regard higher education as a time during which career decisions are held in abeyance.

Most of the central data in the work by Anderson and Western on professionalisation is derived from an inventory designed by them to measure student values.[28] The eight scales are derived from a factor analysis of 58 items and this inventory can be completed quickly by new intakes of students who can then be re-tested at later stages of their courses. The scales test the degree of involvement in intellectual activity, dogmatism, tolerance of complexity, pragmatism, social liberalism, economic liberalism, political liberalism and cynicism.

Anderson and Western are also investigating the relationship between the students' initial expectations of their chosen disciplines, the relationship of these to the vocational aspect of their studies, and the compatibility or incompatibility of the professional roles they are expected to develop. They are examining the hypothesis that because of incompatibility between the two, some students lose interest in their courses and prefer to drop out rather than change their attitudes and values.

Because of some apparent differences, between the personalities, expectations, objectives and values of staff and students attracted to various fields of study, studies of 'the student' in 'the university', according to Anderson, deal with abstractions which conceal and distort what goes on in the process of learning and teaching. Since there exist such differences between departments and institutions and their staffs there is a strong case for having a research unit in each institution. Although overall findings about 'students' are valuable to a certain extent, it would be preferable to have more specific findings about different categories of students. Fundamental research on socialisation and professionalisation of different groups of students, their interaction with their learning environment and other studies of student progress may seem to lack the sharp focus on 'real practical problems' some administrators would like, but ultimately it appears that these studies will enlighten policy more than ad hoc research into immediate problems alone, useful though they may be. It would be most desirable to have both kinds of research in progress at once.

Another example of the study of groups of students as they progress through courses is that of Hill [81] at the University of Otago, New Zealand, who tested 520 student teachers using the F Scale of Authoritarianism of Adorno, Frenkel-Brunswik, Sanford and Levinson. Hill's study produced some important findings relevant to both the selection of students by criteria other than mere academic ability and to effectiveness of the course in preparing teachers. The main purpose of the research was to discover if teachers, as they passed through their training, became more or less authoritarian and prejudiced. The results were reassuring. Juniors at the end of their first year were less prejudiced than new entrants, seniors were less prejudiced than juniors, and the more advanced students were even less prejudiced. It appeared that during successive years at the college, authoritarian attitudes decreased significantly. Of course, it might be questioned if age was the factor involved in producing the decrease, but Hill dismissed this because other studies had shown that experienced older teachers were more prejudiced than teachers in training. It is necessary to ask here if the older teachers had, or had not, the advantage of the same calibre of course as Hill's sample, and if they had hardened after they became practising teachers. Because when the students in Hill's sample were grouped according to their academic qualifications there was evidence suggesting that higher qualifications were associated with a low rating in authoritarianism. Hill also analysed his data according to the church and religious adherence of his sample. Certain religious groups were more prejudiced than others. The most prejudiced group on entry became less prejudiced as they progressed through their studies, while the gap at entry between the most and the least prejudiced narrowed.

Hill asked if the presence of highly prejudiced authoritarian people on a teacher training course may be of grave consequence to the teaching profession, for, if teachers do influence their pupils' attitude development, what problems may be initiated by the graduation of such prejudiced teachers from colleges. These are fundamental research problems of far reaching importance. There are equivalent questions to be asked about any profession. The implications of these studies for policies of selection and examining are such as to call seriously into question selection procedures which depend on ability and academic competence alone.

Other professionalisation studies include those initiated by the Senate of the University of Queensland[195] ten years ago. These were intended to survey regularly the major professions for which the university provided training, in order to provide data on the anticipated growth of the professions and to enable the university to expand its training facilities to meet any unsatisfied graduate demand. This information was expected to be useful to school vocational guidance officers and student counsellors and appointment officers, for drawing comparisons between the conditions and salaries of different professions. The repetition of these studies over the years provides valuable data for plotting trends in each profession. The studies each contain historical and statistical data including the sex, age and numbers in each profession, the geographical location of the professionals, income, assessment of the shortage of practitioners, the degree of job satisfaction and reasons for dissatisfaction and difficulties in practice, interest of graduates in refresher courses, the status of each profession, and the sizes of private practices and kinds of firms employing the graduates. Architecture, dentistry, pharmacy, surveying and veterinary science are among the professions which have been studied to date.

Other Studies

These include several historical, sociological, demographic, economic, administrative, descriptive and comparative studies.

Dental students, their origin, initial motivation for entering dental courses, and their plans after graduation, were studied by Barnard, Wearn, Dowsett and Siu at the University of Sydney.[37] The average Australian dental student is young, usually only 18 at entry, and completes his five years' course on average at 24·8 years of age. The entry and graduation occur at a younger age than American dental students, for example. Fifteen per cent of recruits to the dental courses come from Asian countries, and 80 per cent of each year's intake, are drawn from suburban families in the capital cities where the dental schools are located, and live with their parents throughout their courses. Generally their background is summed up as city (or suburban), male, and educated in private (non-state provided) schools. A high proportion of their parents had received higher education of some kind and were engaged in business and professional occupations. More than 25 per cent of the fathers had a university degree (7·5 per cent dental degrees). Choice of dentistry as a career was often the result of knowing a dentist personally or because their fathers were either dentists or connected with the profession in some way. Their plans after graduation follow a fairly common pattern, with 50 per cent believing a further degree or diploma to be necessary. The majority take salaried positions at first, and a large number then go to work in the United Kingdom. At any one time there would be approximately ten per cent of dental graduates working abroad, but eventually most return to private practice in their own home states.

Factors influencing the choice of teaching as a career by 1465 teaching scholars are being studied by Esselbach.[65] It was found that most of the respondents came from state schools, and would have remained at school for another year but for receiving a teaching scholarship. It appears that a high proportion saw teaching as a means of obtaining some form of higher education because only a third considered they would have been able to enter any form of higher education if they had not received a scholarship and allowances.

Two separate studies – one in New Zealand[198] and the other in Tasmania[185] – have shown that the intellectual status of those entering the teaching profession compares very favourably with that of entrants to university. The Tasmanian study, however, shows that their academic performance at the university compares unfavourably with that of the general university population. In the report no attempt has been made to interpret this finding psychologically or sociologically. It may be that the purely academic aspiration of teaching candidates is lower

than that of other students, or that they are more vocationally, or practically oriented, but more evidence would be required to substantiate this.

One study which combines a historical and sociological approach is that of Pike – a doctoral thesis – at the Australian National University.[139] It is a study of the state school teachers of New South Wales from 1880–1963. Described as a sociological profile it consists of two parts – the first is a historical profile covering the period 1880–1942 in which the dependence of Australian education on English precedents and the role of state primary teachers in the education of working class children are discussed. Teacher recruitment, training and employment policies of the state government in the later years are studied with some emphasis on social influences upon recruitment. Part two presents the results of a questionnaire sent to 1700 student teachers in the final phase of their studies. The data include information about age, country of origin, state of birth, amount of secondary education, previous employment, types of secondary school attended, educational level of parents and the element of self-recruitment from the homes of teachers.

The Queensland State Department of Education is sponsoring a follow-up investigation of an entire intake group of student teachers of ten years previously. It is planned to survey all those employed by the service in terms of their initial training, academic qualifications and classification, and an analysis of their reasons for resignation or migration out of the region is to be included. The Australian College of Education conducted a similar nation-wide study in 1965.[33]

An unusual study using structured interviews of the role perceptions of members of the Senates of two universities was carried out by McCaig,[111] when Assistant Registrar of the University of New England. The 39 respondents – 13 academics, 20 lay members and 6 government representatives – were questioned on what they considered to be the functions of senates, the particular role of each group in the senate, and what each member considered to be the role of members of other groups in senates.

The functions of senates as perceived by the different groups were similar. Except for the laymen, they agreed that the main functions were business management, review or conciliation and ratification of educational policy. There was little indication – again except from the laymen, to suggest that they saw long-range planning and student welfare coming within their main concerns. It may be that student welfare was seen as a role of individual academics in close contact with students, but long-range planning might well have been expected to be considered a senate function. McCaig does not go into these possibilities. The academic members were most prominent in viewing the senate as primarily a management body, thus it seems likely that they felt their academic roles to be fulfilled in other settings. Laymen were most to the fore in viewing that the senate should be concerned with formulation of educational policy and accountability to the community, in contrast to the government nominees and academics who both omitted these functions from their responses. Maintenance of academic values was not seen by laymen as one of the senate's functions and only 7 per cent of the academic and government nominees' responded affirmatively to this.

Academic members saw their role as primarily educators with professional knowledge rather than as representatives of academic staff, but laymen and government nominees saw the academics as a bloc representing other academics rather than bringers of professional knowledge.

After qualifying his finding by noting that in small groups the influence of individuals can be strong and that attitudes to current problems can colour perceptions, McCaig stressed that his findings should be regarded as tentative and more in the nature of

hypotheses. But they are nevertheless of considerable interest and the possibilities for further research in this field are most intriguing. Although senates have a wide range of legal and ascribed powers, they were not seen by their members as bodies to extend the initiative and experiment which would be permitted by the acts and by-laws. Most members saw their senates as having the few well-defined functions already discussed.

Two administrative studies investigating the roles and relationships existing among people and organisations with common and related tasks are in progress. One at the University of New England, sponsored by the Australian Commonwealth Advisory Committee on Advanced Education, is seeking to discover what are the relative functions of agricultural colleges and university faculties of agriculture and rural science in order to ascertain the extent to which their functions are supportive, overlapping or competitive. The field work involves four colleges and departments of agriculture, and data are also being collected from policy formulators in government departments, industry and employer organisations. The other research at the University of Western Australia includes some work on the relationship between two teachers' colleges and a university department of education and the development of subject studies in a technical college and a university and the relationship between them. These are parts of an overall study or the specific and interrelated tasks of institutions of tertiary education in Western Australia. It appears to be primarily an administrative study but much historical data are also included. Another project in progress at the University of Queensland aims to study the factors influencing the decisions of people at the university with special reference to university recruitment. Interviews are being conducted with academic staff, heads of departments and students who are potential academics.

The demand for higher education, as in most other countries, is rapidly growing in Australia. The population in this fast expanding country is still small, and the need for more graduates is acute, yet too many potentially good students fail to enter higher education. Schonell,[173,174] cited some statistics from the Research and Guidance Branch of the Queensland Department of Education which show that of the most highly talented school pupils i.e. those getting an 85 per cent pass at the primary school, only 41 per cent of the boys and 24 per cent of the girls eventually go to university. Changes made in the secondary school system have led to considerable improvements, but a large section of able young people are still not entering higher education.

In an outstandingly egalitarian society such as Australia's, it is quite remarkable and anomalous that entrance to university is so biased in favour of upper occupational and professional groups. In his paper to the Australian Medical Association[174] in 1962, Schonell reported that 42 per cent of the students in one Queensland study were children of the 8 per cent (of the population) in professional, semi-professional and administrative occupations. These students were five times 'overrepresented', while only 3·5 per cent of students of the 35 per cent of fathers in semi-skilled and unskilled occupations were represented. This compares very badly with Britain where 25 per cent of students in higher education are from working class families and 7 per cent from semi-skilled and unskilled groups. These figures are not directly comparable perhaps, but allowing for differences between the two countries this disparity is quite startling and contrary to expectations.

The attraction of university education, as opposed to the alternative of a well-paid job with a good future at the end of school days, is well recognised by Australian parents of all occupational groups. This was one of several finding by Philp, Debus, Veidemanis and Connell[138] at the University of Sydney in a study of the university, the attitudes of the community to it, and the functions attributed to it by the community, undergraduates and graduates. More than 75 per cent of respondents of all occupational classes favoured

university education rather than a good job for their sons, and over 50 per cent favoured it for their daughters which suggests that very strong home support would be forthcoming for children having the opportunity to attend university with scholarship support. Of those who did not favour it, mostly the lower occupational groups, the reason was generally because they thought they would not be able to afford the costs involved. Although actual expectations of educational opportunity were in keeping with the established middle class bias in student intakes, 70 per cent of people in the community considered that all young people capable of profiting from university studies should be able to attend.

Other findings by Philp, Debus et al were that undergraduates perceived the primary functions of universities as being in the following order: training professionals, (40·1 per cent), providing a broad cultural education (37·8 per cent), academic research (19·4 per cent), and industrial research (4·5 per cent). These were predictably biased according to whether the respondents were arts or science undergraduates, but the overall picture was not much changed when results were broken down. The outstanding exception was that of the engineers, 40 per cent of whom gave 'broad general education' the lowest ranking. The chief reason for coming to the university given by graduates and undergraduates was 'training for a profession' (59·5 per cent and 68·8 per cent). Broad cultural education was placed as first objective by 19·4 per cent of graduates and 15·1 per cent of undergraduates, with women being more in favour than men. Parental pressure was the main factor in the decision to enter university for 4·6 per cent of students. Students and graduates tended to view teaching as a more important function than research, but respondents in the community regarded teaching and research as of equal importance and almost equally favoured theoretical and practical (fundamental and applied) research.

The University of Queensland student population in 1962 was about 45 per cent part-time or external. This seems extraordinarily high, but there is an advantage for those who live in distant rural regions or have family responsibilities and career commitments. If lacking funds or a grant, they can spread their time in getting a degree over many years, whereas they would otherwise be deprived of all higher educational opportunity. The high proportion of part time and external students also suggests that there is a great demand for higher education which is far from being satisfied. The aspirations and determination of the part-timers are often prodigious. Meddleton [118] made a study of the problems of 510 part-time students, and analysed differences between them and their full-time peers. Ninety per cent of these part-timers were in full-time jobs, 50 per cent were married, and 38 per cent had children. On average they were able to spend only 4 hours weekly at the university. Their average age was 28 compared with the full timers' average of 21. They mostly had to study after a full day's work, their access to the library was extremely limited (the full-time students' greater access often interfering with the part-timers' access) and frequently their jobs kept them busiest around examination time. The full-time students were comparatively free of any of these stresses and had numerous other advantages. Meddleton considered that there was a strong case for separate special facilities for external and part-time students similar to those of Birkbeck College in the University of London. The main reasons for their cancelling of enrolments were 'not enough time for study' (34 per cent), illness (12 per cent), and changed work locality (8·6 per cent). Meddleton considered, however, that it was hard to define a part-time drop-out, partly because many of them took up studies for reasons other than graduation – often no doubt a real interest in learning for its own sake. However it would be wrong to assume that they did not wish to get their degrees for although fewer part-timers than full-timers said they had to pass the examinations at all costs or that it was very important to pass them, a negligible proportion said that it did not matter whether or not they passed. Among other special arrangements for part time and external students, Meddleton suggested summer schools, improved counselling and guidance and a good deal of

differentiation in the structure of their courses from that of the full-time courses. Some of these provisions are now embodied in arrangements for external students at both Queensland and New England Universities.**

The following discussion of several articles and books, although not all research reports in the strict sense, aims to provide the reader with a clear understanding of the history, aims and philosophy of Australian higher education both in relationship to modern Australian society and to higher education in other countries. The theses developed by each writer cannot be dealt with in a monograph of this size, but it is recommended that those interested should read the following leading writers in the field.

Partridge, writing on trends and problems in Australian universities, deals with the history and the transition from medieval to modern roles of the universities, their structure and relation to modern society, and the relevance of these to future planning and policy. In his recent book, *Society, Schools and Progress in Australia,* [134] Partridge includes sections on universities and their place in the organisation of public education, patterns of higher education and technical and adult education. Organisation and planning, philosophy, growth and development are analysed against the background of Australia's history and politics.

"The Idea of the University in Its Australian Setting" is the title of an article by Auchmuty, [30] which is a critical and historical review of Australian universities. Higher education in relation to Australian education generally is the subject of a symposium edited by Cowan and entitled *Education for Australians.* [55] It contains a chapter by Sanders giving a description and concise history of the development of Australian higher education up to 1964. Other chapters describe the Australian tradition in education, economics of education, technical and technological education, the training of teachers, examinations, educational administration, adult education, research, and a demographic study of factors, including projections of the future demand for university places, influencing the future development of Australian higher education. A historical analysis of the relationship between science, education and the economy by Encel contains a discussion of the influences affecting the demand and supply of scientists and technologists and a plea for more scientific analysis of the social influences affecting the shortage as a prelude to improving policy.

A short history has been prepared by the first vice-chancellor of a university which is atypical in many respects – the University of New South Wales.[38] Its development is traced from the first parliamentary act, through the planning stages to its standing, only 14 years later, as a major Australian university with 11,000 students and an envisaged student population of 25,000. It has already developed from a technological institute into a university with a full range of academic disciplines. Such growth rates are not considered extraordinary in Australian universities, and though the problems which arise can not always be adequately dealt with, they are taken for granted and are approached with vigour. Other universities are planning growth on an equal scale (Monash has 10,000 students after only 10 years of existence), but the University of New South Wales remains unique in several ways. Baxter relates in his short history of the university that a radio university, having seminar rooms at the University of New South Wales, opened in 1960, and by 1964 had 2,600 students. In 1959 the university also established a firm named Unisearch Ltd. through which the university accepts consultancies from industry and government and the profits are paid into university revenue. The same university has an education research office which deals mainly with its own education problems with less emphasis on fundamental research, though there are signs that the emphasis is shifting in the latter direction.

** The Open University has drawn considerably on Australian research and experience.

CONCLUSIONS

The record of research into higher education in Australia and New Zealand must be regarded as impressive considering the small resources allocated in the past. Practical research on selection and academic performance is gradually giving way to research into other issues related to student progress as institutions become more aware of the need to examine themselves, their teaching, their overriding objectives and aims, the quality of their graduates, the professions and the personal development and suitability of graduates for these professions.

Although a considerable body of research has clarified the nature of wastage and failure and the relative importance of student variables, there is still some support for study of these problems in individual institutions to continue alongside research into other more fundamental problems of higher education. For example, attention needs to be focussed on individual subjects and departments because of the differences between subjects and students studying them and the differential rates of failure.

The days are passing when the literature – except for the hard research done by a few pioneers, consisted largely as Schonell[174,177,178] says of informed and scholarly opinion coloured by experiences and attitudes of the authors. There is no move to undervalue works of that kind, but there is clearly a more research oriented atmosphere.

In spite of the impressive record, the present provision is not great. There is a tremendous amount to be done, but recently there have been some regrettable cuts in the resources available for research in general, even though past research in higher education has demonstrated the value of providing resources on a larger scale both for the benefit of the institutions themselves and for higher education policy generally. In a country where higher education has been such a growth industry and must become so again in the future, redoubled efforts will be needed to make up this lee-way. It will be important for planning councils to have access to a wide range of data which it is beyond individual members of councils to amass. No research centre in Australia or New Zealand exists at present which is charged with the responsibility to investigate planning and development.

In such egalitarian societies as exist in these countries, it might be thought worth while to investigate ways of bringing into higher education a greater proportion of students from non-professional and non-managerial class backgrounds. Both countries have a long way to go before they can match Britain's 25 per cent of students from working-class homes, which has existed since before the last war.

Areas of research which merit further attention in the future include possibilities for improving professional courses, comparisons of the advantages of students in residence or living at home, and a re-assessment of the advantages of specialised honours courses as compared with general science and mixed science/arts courses. These latter have been mooted in Britain in such documents as the Swann Report (1968) and are already established in a few British universities to provide a better preparation for management in industry and allow for greater flexibility in later careers. There are many more educational questions requiring scientific research to aid planning committees and government. At the present stage of development in Australia and New Zealand – small populations with accelerating development – it would be appropriate to ensure that development in higher education is related

closely to those countries' needs and not fashioned too much in the likeness of institutions abroad as was the case at one time. There is some qualified optimism that research into higher education in the future will be supported sufficiently to ensure its fuller contribution to those ends.

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APPENDIX

THE PROBLEM OF FIRST-YEAR FAILURE IN AUSTRALIAN UNIVERSITIES: PROPOSALS FOR FURTHER RESEARCH

C. Sanders

Summary of an Address given to the Western Australian Institute for Educational Research, August 9, 1960

1. First-year failure varies with Faculty and University. 30% approx. May be as high as 50% in certain departments before supplementaries and repeats are brought into account.

2. Causes are many and complex and are associated with –
   - (i) University and faculty objectives.
     Note: (a) Difference between institutions which are national and international and institutions which are mainly local.
     (b) The problem of universities setting their own internal standards.
   - (ii) Teaching and examining.
     – Study load.
   - (iii) The university environment.
     – Guidance and Health Services.
   - (iv) Transition from school to university.
   - (v) The changing nature and expansion of universities and the educational attitudes of staffs.
   - (vi) Growth of knowledge affecting curricula especially in the sciences and technologies.
   - (vii) Growth of student numbers.
   - (viii) University selection.
   - (ix) University facilities.

3. An Australian Conference on University Education was held in Melbourne early in July. What became apparent at the Conference:
   - (i) Better selection not a complete answer. To raise the first-year pass-rate from 66% to 90% by selection alone would involve rejecting 90% of present candidates of whom 4 in 10 would graduate.
   - (ii) Better construction of tests not a complete answer – including more accurate ranking of students.
   - (iii) Better teaching not a complete answer – needs to be accompanied by better learning.
   - (iv) Better facilities not a complete answer.
   - (v) Purely psychological investigations whether cognitive or clinical not a complete answer.
   - (vi) That considerable research into the problems has now been carried out in:
     – University of Queensland.

– University of New South Wales.
– University of Melbourne.
– University of Tasmania.
– University of Western Australia.

4. What we know about Selection:
   (i) Matriculation Examinations correlate with University Examinations at about 0·6. But individual subjects are much lower.
   – Very often the best correlations are between language subjects on the Arts side.
   – Good correlations may be obtained between Mathematics, Physics and Chemistry.
   – Raising the selection point eliminates potential graduates as well as failing students.
   (ii) Psychological Tests are uncertain predictors.
   Correlations seem to be better in the Humanities and Social Sciences than in Pure Science.
      (a) 0·3 to 0·4 about the best obtainable at the University level, but 0·5 to 0·6 occasionally in Arts and often zero or even negative correlations in Science subjects.
      (b) Objectivity of measurement and improved statistical reliability of examining, while educationally necessary, do not, in practice, seem to alter correlations very much.
      (c) A great deal of work has been done in the above field but causation of success and failure by such means remains elusive.

5. Social and Environmental Factors are important in the Success and Failure of students. Melbourne University has done a good deal of work in these areas. Factors in failure seem to include:
   (i) Bad or inadequate accommodation and housing.
   (ii) Inadequate understanding by parents of the study demands Universities today make on students.
   (iii) Personal isolation of students (especially country students).
   (iv) Wrong attitudes towards University study by many students. These are unable to adjust to the problem of distant goals, the immediate need of personal responsibility and effort.
   (v) Linked with (iv) is a problem which affects bonded students or students with the failure prospect of being forced to become part-time.

   Factors in success include:
   (i) That the family has a background of secondary and higher education *or* that higher education is a good thing.
   (ii) Going to a scholarly school, and not necessarily an examination pressure school.
   (iii) Going to a well-run University College with good control and tutorship, in which students can help each other.
   (iv) A tendency to mental and physical toughness and introversion.

6. Some of the things that have been found out about the Success and Failure of Students, and especially First-Year Students:
   (i) Students from Country High Schools show a lower overall graduation but some of them attain high Honours and Ph. D. degrees.
   (ii) Women students in some Universities show a lower graduation rate than

men. This is not always due to failure.

(iii) In Victoria especially, and to a lesser degree in W.A., the overall graduation from non-government schools is higher than from government schools – particularly in humanities studies. Students from government schools do best in Pure Science, Engineering, Agriculture, Dental Science and the Social Sciences (Economics, Psychology). Students from non-government schools show superior performance in Arts (languages), Law, Medicine, etc.

Note: Overall graduation differences in science and applied science have not been very different in the two groups. But students from government schools have produced more Honours and higher degrees in these faculties. In Law, Medicine, etc., the non-government schools have done so.

– In Victoria, Honours degrees in Arts are strongly represented among the non-government schools.

– – In one survey in Western Australia a selective metropolitan senior high school showed only a 50% graduation in this faculty. Students taking up teaching, are partly a cause of this result.

(iv) Arising from Queensland researches, supported by W.A. researches, a predictive factor associated with University success and failure, relates to the following categories of student *either* at time of entry or at the end of University first year, viz –

Whether students, in terms of school or examination performance, fall into the following categories:

(a) up-ranking;
(b) constant or equal ranking;
(c) down-ranking.

A high degree of failure comes from category (c).

(v) Arising from W.A. researches, success and failure is also associated with the interrelations of scholastic aptitude and scholastic performance.

– Group tests of intelligence (e.g., Test B40 or ML–MQ or AL–AQ) are mostly scholastic aptitude tests compounded of:

(a) Vocabulary (as well as meanings and concepts related to it) and verbal reasoning; and
(b) Quantitative and mathematical reasoning.

When a total score or I.Q. is computed, students who fall into the category of High Scholastic Aptitude (e.g., high I.Q.) – Low Scholastic Performance at time of University entry are a bad University risk especially in Science.

– In many cases these students, in terms of the Queensland researches, are scholastically down-ranking in examinations despite their high I.Q. or scholastic aptitude.

– First Class Honours students in the Humanities and the Sciences tend to come from the group which shows High Scholastic Aptitude combined with High Scholastic Performance. In the Humanities (among full–time students) high scholastic aptitude and high scholastic performance (and vice-versa) tend to go together.

– Second Class Honours students especially in Science very frequently come from moderate or lower than average scholastic aptitude combined with consistent to high scholastic performance.

– Failing students in Pure Science (especially in physical scienc , including mathematics, physics and chemistry) often have high I.Q.'s

or very high I.Q.'s.

– Successful students in Science (taking account of a slower rate of progress) often come from the I.Q. bracket 110–120. These students show a consistent scholastic performance.

(vi) Verbal Aptitude is a fairly good predictor of success in Humanities studies.

– Humanities students usually show a relatively high verbal aptitude and a relatively low non-verbal aptitude (quantitative and mathematical aptitude).

– Women students (except those who enter Science) conform to the aptitude pattern of Humanities students.

(vii) Verbal Aptitude is a better predictor over the whole University than non-verbal aptitude (including the Sciences as well as the Arts).

(viii) Non-verbal aptitude can be a very unreliable predictor especially in the Sciences.

7. Some Implications of a Research Study Based on the 1947 Intake of W.A. University Students:

(i) Students consisted of (a) students direct from school (men and women), and (b) ex-service students, the great majority of them men.

(ii) Ex-Service Students (5½ years older on average than students from schools) showed a higher rate of graduation and a higher rate of graduation in minimum time (than students from schools) in the Humanities and the Social Sciences.

(iii) Ex-Service Students had a significantly higher verbal aptitude than the students from schools. Their Leaving Examination performance was significantly less than students from schools. *Nevertheless,* successful students from schools who were successful in the Humanities also had high verbal aptitude, but often average to low non-verbal aptitude.

(iv) Ex-Service Students and students from schools showed about the same rate of graduation in the Sciences. There were no significant differences in non-verbal aptitude but the Ex-Service students had a significantly higher verbal aptitude. They also had a significantly lower Leaving Examination performance.

(v) In other words there were certain important differences between the Ex-Service Students and students from schools in both their aptitude scores and their performance in examinations, and especially when Humanities studies were separated from the Sciences.

(vi) With students direct from schools there was a negative correlation with increasing age of entrance and the aptitude scores as well as with examination scores (in both Arts and Science).

(vii) With Ex-Service Students (men) there was a positive correlation with increasing age of entrance and

(a) Verbal Aptitude, and

(b) Examination Performance.

But a similar relation with Non-Verbal Aptitude could not be established.

(viii) Some other points include:

(a) Leaving English correlated with most University subjects (in Arts and Science) in the same way as Verbal Aptitude. But the highest correlations obtained were between English and itself at a higher level or between English and Languages other than English (especially at the University level).

(b) Mathematics was a poor correlator except with itself, Physics and Chemistry. Mathematics seemed to show some of the characteristics of Music. It is acquired as a competence by many but is inherent as a virtuoso ability by only a few.

(c) In 1st Year Arts subjects there were significant inter-correlations.

(d) In 1st Year Science subjects there were significant correlations.

(e) Memory is an important factor in first-year success. Many students especially in Science have to acquire a substantial additional vocabulary.

(f) Individual 1st Year Arts subjects each correlated about ·80 with a total 1st Year Arts score and individual Science subjects each correlated about ·80 with a total 1st Year Science score.

(g) Implications from (f) include:

(1) that University examiners in the different University departments are tending to rank students in the same way.

(2) that students who tend to perform well in one subject (provided the Arts framework *or* the Science framework is maintained) tend to perform better in other subjects of the same kind – and *vice versa.*

Note: Recent work by A.W. Anderson has brought this out much more clearly.

(h) Where inter-departmental differences tend to occur is in the cut-off point between passing and failing. This also has been brought out strongly in recent work by A.W. Anderson.

(ix) Some hypotheses arising from the data include:

1. That in terms of Verbal Aptitude this may go on rising with increasing age and experience to 25 years at least – and possibly more often among men than women.

2. That cultural and sociological factors are associated with the Verbal Aptitude score since women students (except those enrolled in physical science) tend to show a significantly higher verbal score than non-verbal score.
   Note: This also occurred among Ex-Service students whose non-verbal aptitude scores were not different from men students direct from schools.

3. There is no clear proof from the research that non-verbal aptitude (quantitative and mathematical reasoning) goes on increasing in the same way as verbal aptitude.

4. Since Ex-Service students who entered scientific faculties had mostly
   (a) had some mathematical and scientific experience while in the forces.
   (b) received some mathematical and scientific training at Leaving level before entering the University;
   and since –
   (a) they did not perform better than students direct from schools in scientific faculties and
   (b) did not produce superior non-verbal aptitude scores,
   then –
   (1) Mathematical and scientific skills tend to be acquired young.
   (2) They need to be used and fostered to remain effective (and presumably may be lost more easily than verbal skills if not used).

(3) Non-verbal aptitude may have a ceiling in a way that verbal aptitude does not appear to have, and this ceiling may be reached before most students enter our Universities.

5. If what I have stated is correct, it would resolve the dilemma that –
   (a) the younger are the brighter and
   (b) the more mature also do better.

   The "young brights" would be:
   (a) those with high verbal and non-verbal aptitude (i.e. Arts or Science students);
   (b) those with high verbal aptitude but much lower non-verbal aptitude (i.e., Arts students).

   The more mature would be Arts–type students whose verbal aptitude tends to increase with age and experience.

6. A further implication is that a gap between school and University would be more likely to benefit an Arts student than a Science student. The latter would tend to lose his skills even though he gained in worldly experience. The former would tend to improve himself, including his verbal skills, by reason of his worldly experience.

7. Another implication is that if there is a positive relation between I.Q. and performance (or between scholastic aptitude and performance) as we have assumed in the past, it may at the University level be more evident on the Arts and verbal aptitude side, than on the Science and non-verbal aptitude side. But if this is so, and continuing,

   Then, in the ordinary course of events –
   (1) Verbal Aptitude, as well as ability in the Humanities and similar studies, may be sustained, while
   (2) Non-verbal aptitude, as well as ability in Mathematics and the Sciences, may not be sustained.

   The above contention is supported by a substantial research undertaken with American graduates and reported in the (Amer.) *Journal of Educational Psychology* in 1954. What came out of the research, which was based on objective assessments, was that –
   (1) there was a decline in ability with increasing age up to 55+ years in Physics, Chemistry and Biological Science; and
   (2) there was no similar decline in the Fine Arts, Literature and Social Science.

8. Areas of Research

   As a great deal of research of the type already described has been conducted in Australia and abroad, the following represent a few areas in which considerably more knowledge is needed:
   (1) The effect of college or hostel residence on student development and academic performance.
   (2) Problems of part-time and external students.
   (3) The effect on staff and student attitudes of University expansion and heavy student influx.
   (4) The social composition of the student body at the present time and its effect on academic performance.
   (5) Appropriate methods of teaching for the upper classes of secondary schools and at least the first year of University.

(6) The work load of students and its effect on academic performance.

(7) Methods of student assessment expecially in first-year and their relation to Faculty and departmental objectives.

(8) The standardisation of academic achievement tests at the University level.